DOCUMENT RESUME

ED 062 738 EC 041 935

TITLE Exceptional Children Conference Papers: Objectives, Methods, and Alternatives.
INSTITUTION Council for Exceptional Children, Arlington, Va.
SPONS AGENCY Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
PUB DATE 72
NOTE 130p.; Papers presented at the Annual International CEC Convention (50th, Washington, D. C., March 19-24, 1972)

EDRS PRICE MF-$0.65 HC-$6.58
DESCRIPTORS Art; Conference Reports; *Curriculum Development; Educational Methods; *Exceptional Child Education; *Federal Legislation; *Handicapped Children; *Research Design; Study Habits

ABSTRACT

Nine conference papers focus on objectives, methods, and alternatives in the education of handicapped children. The first paper, by Sidney P. Marland, U. S. Commissioner of Education, reports on progress made towards full educational opportunity for handicapped children. Research design and methodology are discussed in relation to curriculum research past and present, a five-category research framework, and design of a curricular research methodology. Other papers concern the special education resource room, a model preschool for handicapped children and the behavior modification model, competency based education, the usefulness of instructional materials, inservice teacher education to improve services to mildly handicapped children in the regular classroom, the effects of isolated study on academic performance, and an exhibition of art by the handicapped. (KW)

ED 062738

Exceptional Children Conference Papers
Objectives, Methods, and Alternatives

Papers Presented at the
50th Annual International CEC Convention
Washington, D.C.
March 19-24, 1972

Compiled by
The Council for Exceptional Children
Jefferson Plaza, Suite 900
1411 South Jefferson Davis Highway
Arlington, Virginia 22202

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EDUCATION OF THE HANDICAPPED: CLOSER TO EQUALITY*

By S. P. Marland, Jr.
U.S. Commissioner of Education
Department of Health, Education, and Welfare

A year ago, at your convention in Miami, Ed Martin made the initial public announcement that full education opportunity for handicapped children had been designated as a national goal of the United States Office of Education. Today, on your 50th Anniversary as an organization dedicated to improving the lives of handicapped boys and girls, I would like to report to you on the progress made toward that objective.

We all recognize that bringing full educational opportunity to the handicapped children of America --- the six million of school age and the one million preschoolers --- is a challenge for this entire Nation. It is not a challenge that the Federal Office of Education alone can assume. It is not a challenge that the local communities can meet using only local resources. It is not a challenge that State governments can cope with by themselves. Our call for the development of a national goal of education for all handicapped children by 1980 was a call for leadership from within the entire education community, a call for the cooperative activity without which we cannot hope to achieve this goal as a total Nation.

During this year, we have attempted to strengthen the State, local, and Federal partnership which has been growing over the past decade and to accelerate its progress. Education for the handicapped did not start this year simply because we have given it a new importance in the Office of Education. Your own 50-year engagement in the noble struggle is striking evidence of the long history of concern that many educators and many private citizens and, of course, many parents have felt for the need to develop the abilities of the special child. But I do think there is an important qualitative difference in special education this year. By establishing education of the handicapped as an objective of the Office of Education, all of us in that Office share a sense of concern and involvement in the objective, rather than just our specialists in the education of the handicapped. Specialists in higher education, vocational education, educational research, teacher training, and so forth --- all the members of our family are involved and their involvement, I would say, grows deeper by the day.

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*Before the 50th Anniversary Convention of the Council for Exceptional Children, Sheraton Park Hotel, Washington, D.C., Friday, March 24, 1972, 7:30 p.m.

If one analyzes the development of educational programming for handicapped children, the credit must be given in large part to groups such as your own --- to teachers and other education professionals who have been advocates for the children they serve. Recognition must also be made of the tremendous contribution that parents have made. They have carried their case to school boards, to State legislatures, and to the United States Congress itself in attempting to develop a public policy that would be responsive to the needs of handicapped children. The legislative bodies have responded and continue to do so. More recently the Courts have begun to respond as I will discuss in a few minutes. But to be thoroughly honest with you, general educators have not always provided all of the leadership in this area that might have been desirable. This has by no means been universally true, of course. Many principals and local and State superintendents have in a variety of instances aggressively pursued more programming for handicapped children. But impeding these efforts has been the fact that the cost of educating handicapped children is inevitably greater, that there are many and cogent competing needs for funding, and that responsibility for seriously handicapped children has been left largely unassigned. Are they the responsibility of the schools? Or are they the charges of other kinds of social organizations? These factors have produced an uneven pattern of leadership within the education community. It is to this point that I think that I, as Commissioner of Education, and Ed Martin as Associate Commissioner of the Bureau of Education for the Handicapped, must attend. We must to the best of our abilities and to the limits of our resources attempt to join with our State and local colleagues in providing leadership toward achieving the goal of full services to handicapped children.

In planning for this objective, we developed four national targets for Fiscal Year 1972: First, 100,000 handicapped children in preschool programs. Second, 250,000 children added to the special education roles. Third, 250,000 children and young adults receiving vocational education in order that they might leave school with marketable skills and a chance for self-sufficiency and increased self-regard. Fourth, 17,000 teachers and professional personnel receiving the full or part-time training that will be necessary in reaching these other goals.

Early Childhood Education

A major focus of our concern has been in stimulating the development of early childhood programs for handicapped children. The research that you and your colleagues have done has suggested that in each area of handicapping conditions early stimulation and training can reduce or eliminate later educational handicaps. The significance of this in human terms --- in the reduction of frustration and failure for children as well as in the amelioration of despair and isolation for parents --- is obvious. And, in addition, there is increasing evidence that such programs are cost-beneficial in that they will reduce costs of later institutionalization or full-time special class placement.

Reports coming to us from our Model Preschool Programs are very encouraging. By the end of this year we will have at least one model program in each State. There is a tremendous variety in these programs. Some are serving infants in the first year of life, others concentrate on the five and six year olds; some deal with small groups of similarly handicapped children; others work to integrate handicapped into programs with nonhandicapped. There are programs in rural areas, and in inner-cities, some dealing with Spanish-speaking, and some with Indians. There are programs in schools and there are programs in hospitals.

In short, we are attempting to reach into widely varied segments of our population in order to gather from each wisdom in relation to preschool and early childhood training, and to give to each an assist in demonstrating the effectiveness of programming for handicapped children of all kinds. Program after program report gains in children's language and cognitive functioning, reduction of the sort of disruptive behavior that has caused children to be excluded from regular day care and preschool programs, and other well-documented and deeply encouraging improvements. We established the goal of 100,000 children in preschool programming at the end of this year on the basis of several factors: our accelerated efforts, increased efforts on the part of States to use Education of the Handicapped Act and State money for these purposes, a specific effort on our part to stimulate increased participation of handicapped children in programs under Head Start and other authorities, and in general, a full range of catalytic activities including encouragement and stimulation of new State legislation. It now appears that the Nation will come very close to having 100,000 children in preschool programs in 1972. We are able at this time to account for over 70,000 participating in programs under the Education of the Handicapped Act and Title VII of the Elementary and Secondary Education Act. And the complete roster of reports will not be available to us until sometime after the school year ends. As professionals in this field you know, as I do, that there is no comprehensive record-keeping system which can account for all the handicapped children in cooperative preschool programs, in privately operated day care and preschool programs across the country. These data simply are not collected systematically by State education agencies. Part of our efforts, then, has been to work cooperatively with the Office of Child Development and other HEW agencies in establishing better records of participation of handicapped children in preschool programming, and there are indications of substantial progress toward this objective. For FY 1973 we have requested an additional $4.5 million for Model Programs which will bring the number supported to 100. Our mutual planning activities with State education agencies and other responsible agencies will continue. For example, we have worked closely with the Governor's office and the Governor's Department of Human Resources in Illinois, offering support and assistance in the development of a new program in that State requiring preschool education for all handicapped children.

Career Education

Another major Office of Education objective is to accelerate development of the career education concept. In brief, the career education theme calls for a renewal of elementary and secondary curricula to place new emphasis on the variety of career opportunities available to young people Career education would provide information and training in sensible alternative directions that may be pursued, and would provide specific skills training to students so that each would leave public education either with marketable skills or with specific higher education goals, carrying career plans.

The Career Education goal and our Education of the Handicapped goal interact, and this year we have begun by expanding opportunity for vocational education for handicapped children. In 1971, about 115,000 handicapped young people were enrolled in pre-vocation or vocational programming. An analysis from 40 States indicates that over 200,000 children are in programs within those States leading to careers, and it is expected that the goal of 250,000 will be reached this year.

It seems critical to me that the concept of career education takes hold in special education. From the earliest years curriculum should be developed in terms of do-able goals for productive lives for handicapped children. We cannot afford to let special education programming phase out after elementary school but must carry through with appropriate program for junior high school and high school so that our young people may enter into the world of work or go on to further purposeful study with confidence and competence.

Educational Personnel

We will also meet the manpower target we stipulated. In fact, it will be oversubscribed. In addition to providing partial assistance to more than 20,000 undergraduate, graduate, and Special Institute trainees, we have been able to exceed our goals in terms of new programs established and new models of training under our special projects and programs. Other developments in the manpower area encouraging. Our analyses indicate that more and brighter students are enrolled in special education each year, and that because of the overall manpower supply additional teachers are becoming available for the special education manpower pool. The critical problem which faces us and which faces those of you in the teacher education preparation field is to analyze more carefully the competencies which our teachers need, and to relate the progress that children make in school to the kind of training teachers receive. We must focus on the outcomes of our training process so that our goals can increasingly become qualitative as well as quantitative.

In attempting to come to terms with a national problem of the magnitude of the one which faces us in developing special education opportunities for all handicapped and gifted children, we proposed the establishment of 1980 as a target date. In a number of States the target date was legally mandated to be earlier than 1980. For some, such legal dates have already passed, unmet. In other States there is no date by which the task must be done. In order to afford additional services for approximately three million children by 1980, the total national effort would have to provide increased opportunity for a quarter of a million children this year and that figure would have to accelerate over the next few years, reaching the level of between 400,000 and 500,000 children per year as the decade ends.

It may be important at this point to reaffirm the meeting of target figures. There has been some confusion about some that I have mentioned. Not long ago one State leader said to us, "Well, you have established this national goal of full services by 1980. When are you going to give us the detailed plan for our State? When are you going to give us the money to do the job?" While that kind of question surprised us, as we have thought about it we can understand where we have failed to communicate clearly the true sense of our objectives and goals. We do not intend to develop from the Federal Office of Education a specific plan to serve all of the children in

Pennsylvania or in Alabama or in Texas. Clearly we do not intend to impose a Federal plan on those States, or assume Federal responsibility for the education of the children in those States. We could not if we wanted to since the Constitution assigns primary responsibility for education to the States. What we do hope to do is to establish a national target, one point in time against which we can, as a Nation, measure our progress. We hope to provide a climate of leadership by affirming the right of handicapped children to an education, and by highlighting this right in the eyes of the public and in the eyes of the education community. We hope to stimulate the establishment in each State of a similar goal, developed by the people of that State, which would be a plan for the use of local, State and Federal resources in that State. At the same time, in developing such a national goal, we naturally hope to develop on the part of the Federal government --- both the Congress and the Executive Branch --- an increased sense of commitment toward this end and an increased share of national resources for these purposes.

We had an alternative. We could have set our goals in terms of just how far the Federal dollars would go. We could, for example, decide to give scholarships to X numbers of teachers. Or help Y numbers of children with Federal funds. Then we could have reached our goals quite easily, since they would match exactly the dollar resources we had available to us. Instead, we have said that the real meaning of the Federal dollar is not just to do a limited job, but to be a catalyst to the meeting of a national need. The $37.5 million State allocation in Education of the Handicapped Act funds could be spent in this fashion to provide an education for a maximum of 20,000 children at $1,800 per child. But through careful State and local planning in combination with the use of other Federal resources, this same amount could be a catalyst to stimulate better education for hundreds of thousands of children. As you know, we have chosen the latter strategy, and the State directors of special education and the colleges and universities are cooperating with us. They are investing Federal dollars very carefully so as to get the maximum mileage out of them. Programs are supported in areas where there is no State authorization, such as preschool, to demonstrate the value of such programs. Funds are being spent to aid seriously handicapped children --- the multiply handicapped, the emotionally disturbed --- programs for which sufficient State funding and priority have not been available. Funds are being spent to support Instructional Materials Centers and similar kinds of applications of education technology which are not easily supportable under current State program assumptions. Incredibly enough, this year our reports suggest that 90 percent of dollars spent under Part B of the Education of the Handicapped Act, Grants to the

States, was spent for such purposes. Only 10 percent was spent for things that could have easily have been done routinely by the States. So that our goal of 250,000 new children receiving special education then can serve two purposes: First, it can serve as a mark against which the Nation can measure its efforts and help stimulate State goals. Second, it can provide for the parents, children and teachers a method of accountability, a sense of visible stepping stones so that year-to-year progress may be more easily and accurately determined.

A major strategy in developing new education opportunities for handicapped children has been to work cooperatively with other groups. For several years we have supported the CEC activity which has cataloged all State legislation on handicapped children and which has developed a model special education statute. This information resource has been used by a number of States in studying their special education programming.

We also reached out this year to the Education Commission of the States, an organization of governors, State legislators, and professional and lay people interested in education. ECS has adopted as its own goal our 1980 full education opportunity standard. With our support, and with the cooperation of the Council for Exceptional Children, a series of conferences was held around the country in which each State had a chance to examine its special education program in relation to those of neighboring States and in relation to the model statute. The recommendations from these conferences for improvement of State programs are fed back to legislators, to governors, and to State education officers. An index of the activity in this area is the fact that 899 bills have been introduced in State legislatures this year involving education for handicapped children and 237 have passed, 86 of them regarded as major in scope. Every State with a legislature in session has considered special education legislation. A number of very interesting trends are thus apparent:

(1) there is an accelerating movement toward mandatory legislation;

(2) there is a revamping of testing and diagnostic procedures and a greater concern for due process in identifying and prescribing for children;

(3) there is a general concern for the civil rights of handicapped people;

(4) preschool programming is receiving a great deal of attention;

(5) the definitions of handicapped children are being extended to include categories not previously served such as the trainable mentally retarded;

(6) transportation laws are becoming more flexible;

(7) private schools are getting more help, and regional programs are being established.

Now, of course, we recognize that these efforts are not solely attributable to the CEC legislative study or to the ECS conferences, but represent in large part the cumulative effect of years of work by parent groups, by professional groups, by State education agencies, and so forth. But it is also true that in situation after situation the legislators or the State special education officials have pointed out to us that these recent activities have moved them much further along. This week, for example, we have learned that the entire model statute was introduced in one State and that another plans to adopt it in toto. We have had direct contact from three governors in addition to numerous contacts with Chief State School Officers.

Most of our catalytic efforts specifically designed to reach our objective of 250,000 children added to the special education programs will not be felt until the next school year. This year we estimate that 215,000 additional children will receive special education services, and next year the 250,000 mark should be reached. This is 35,000 fewer children than we hoped for this year and about 45,000 fewer children than we hoped for next year, so we must either increase our efforts or lower our expectations. I think conditions are favorable, however, for more rapid gains in future years and thus feel that the 1980 goal is entirely within our reach. I think this optimism is warranted because we have seen new responsiveness within HEW and at the State and Federal legislative levels and because the recent Federal court decisions in Pennsylvania and in Alabama suggest a whole new judicial concern which will provide added stimulation. The Pennsylvania decision says in essence that a child who is mentally retarded, or thought to be by school officials or his parents or guardian, cannot be denied admission to school or have his educational status changed without notice and a chance for a due process hearing. And that by September 1, 1972 every retarded person between the ages of 6 and 21 must have access to a free public program of education and training appropriate to his learning capabilities. Furthermore, if any of the schools in the State provide a program for children younger than six they must also provide appropriate programs for retarded children. The larger message is clear: handicapped children are entitled to public education.

In the Alabama case, Federal Judge Frank Johnson ordered State officials to correct conditions at the Partlow State School and Hospital at Tuscaloosa which is for retarded children. Judge Johnson entered an interim order to correct immediately such things as fire hazards and unhealthful food and to begin a disease immunization program, and also ordered the hiring of 300 staff people by March 31, and this has already been done. According to observers, this is the first time that a Court has held that a mentally retarded person, involuntarily confined to an institution, has a right to adequate treatment and care.

These court decisions are exciting and encouraging and they bring us to a point in time where all the great arms of our Government --- the judicial, the legislative, and the executive --- are increasing their concern for the handicapped person and for his intrinsic rights as a human being. As educators, our responsibilities are not reduced because of this legislative and judicial concern. We know that handicapped children should have an education. We know that education for handicapped children works. We know that preschool programming can positively effect the growth and development of the handicapped child physically, emotionally, and cognitively. We know that given appropriate career education, handicapped children can be employed and we know that if we do our job well 90 percent or more of handicapped people can be partially or fully self-sufficient. We know that handicapped people can participate in higher education and in adult and continuing education. And it is clearly our responsibility to take the leadership in planning such programs, in demonstrating their effectiveness, and in providing equal educational opportunity.

When we made education of the handicapped a priority of the Office of Education it was not a one-year enthusiasm, as it is not a one-year enthusiasm for us to become interested in the gifted and talented children and to establish an Office of Gifted and Children.

Providing appropriate educational opportunity for handicapped and gifted children demands a long-term effort, presupposes a continuing priority, and obviously requires unremitting efforts to focus public attention and public resources on these children.

We intend this year and in the future years to continue our efforts to provide national leadership in special education. We will talk with the Chief State School Officers, we will enlist support from the school boards, we will present our case to the Secretary and to the Office of Management and Budget. I can assure you that it will not be an effort limited only to our Bureau of Handicapped Children and our program for the gifted and talented, but it will be an undertaking woven into the very fabric of the entire Office of Education and the Department of Health, Education, and Welfare. In fact, we are already launching cooperative activities with the National Institute of Mental Health, the Office of Child Development, and the Social and Rehabilitation Service so that we can integrate all our resources more effectively to serve children.

In closing I would like to quote Dr. Larry G. Stewart, associate director of the New York University Deafness Research and Training Center. Dr. Stewart, who is himself deaf, refers to America's deaf as a truly silent minority but one which is growing restless "under the yoke of centuries-old discrimination and denial of their right as Americans to equal treatment under the law."

"The patience of the silent minority is growing thin," Dr. Stewart writes. "How much longer" he asks, "must they wait for the freedom, justice, and equality promised to all Americans?"

The same might well be asked about all of our people who are somehow out of the ordinary, whether their differences are due to handicaps of mind or body, extraordinary mental gifts, social or economic disadvantagement, or race. For the patience of all these special Americans is growing thin.

But we can say today that education at all levels is beginning to respond to their legitimate claims and, as I hope the steps I have outlined to you tonight indicate, the Federal Government is beginning to move with accelerating effectiveness to meet the special needs of the handicapped and the gifted. It has been a long and difficult struggle for you of the Council --- 50 years long. But your message is beginning to be heard throughout America and I would say that as a result the educational prospects of millions of special children were never brighter.

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CURRICULUM RESEARCH: A DIRECT AND CONTINUOUS APPROACH

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MAY 1 1972

Part 1: Curriculum Research, Past and Present

Curriculum has been variously defined. In its broadest interpretation, it can include such educational devices as textbooks, audio visual equipment, and bulletin board displays (Popham, 1969, p. 319). Teachers of every grade level depend to a large extent on these workbooks, texts, films, television programs as instructional tools. Selection of these materials is often based on availability, the teacher's past experience with them or the advice of others, with the result that only sometimes do they prove functional--some children prosper, others flounder.

The necessity for providing teachers with information that will enable them to wisely select curricular materials and methods is obvious. The teacher's responsibility is to assist children to fully attain their potentials and to lead them to "self-actualization." Since curricular materials greatly assist the teacher in achieving these goals, the basis for their selection should be scientifically derived.

For some time curricular theorists and researchers have been evaluating materials and procedures in order to provide teachers with empirical data. Caswell (1966, p. 291) has reported that curriculum research became an established professional activity in the 1920's. However, the influence of this research over the past half century has been slight.

School systems, teaching styles, materials, and procedures have changed considerably since the twenties, but few of the changes were prompted by educational research. Instead, educational change has often resulted from an opinion or a mandate--either the conviction of some influential person or the majority vote of some citizen group.

That educational research has not been more influential in affecting educational reform could be due to the ineffectiveness of traditional educational research methodology. Most educational research has been based on psychological research methodology (Schutz, 1969, p. 360). When educators accept this methodology, their resultant practices can be characterized as indirect, infrequent, and group relevant.

A typical research plan under this schema is to select two groups of pupils, to match them for "relevant" attributes, and to administer one instructional method to one group while the other remains the control group. A criterion test is given at the beginning and end of the treatment, the scores of both groups are computed, and then the researchers statistically determine the differences in the two approaches.

This method is indirect because the selection of a criterion variable, in the form of an achievement, aptitude, or intelligence test, may not be related to what is actually taught. For example, items 1, 2, and 3 could be taught by treatment A, items 4, 5, and 6 taught by treatment B, while the criterion test could sample items 7, 8, and 9 so that gain scores are not reflected by either treatment group. In such a case, a true statement of behavioral change cannot be made since none of the items taught are measured.

The second criticism of traditional research methods is that measurements of pupil performance are infrequent. Often, data are obtained only twice from each participant in the research, once prior to treatment and the other after it. These data do not reveal when behavioral change, if any, took place. Such a pre- post-test strategy assumes that pupils progress in a steady manner from the beginning to the end of a treatment. It is not inconceivable, however, that in certain experiments some pupils will master the concepts on the first day of treatment, others, on the final day.

The third criticism of this type of educational research is that the results are group relevant. Characteristically, scores reflecting the central tendency and variance of two or more groups are calculated and compared. The data are then statistically treated in order to ascertain whether one approach significantly effected more change than the other.

Such data, reflecting group performance, do not necessarily convey the score of any one individual. It is possible that the "average" score within a group is achieved by no one. Furthermore, there is something paradoxical when educational researchers derive conclusions from group data, yet teachers are constantly requested to individualize their teaching procedures.

An alternate curricular research methodology, based on the principles of Applied Behavioral Analysis, is therefore recommended. Such a process as refined by Skinner (1938) and Sidman (1960) details a method of investigation that is Direct, Frequent, and Individually Relevant.

Research based on an applied behavior analysis framework differs considerably from the approach described above. An applied behavior analysis is an attempt to establish the functional relationship between the rate at which a behavior occurs and some associated event. More concern is directed toward an experimental explanation than to a statistical interpretation of behavioral relationships. The applied behavior analyst, in his efforts to demonstrate functional relationships, first measures a certain behavior for a period of time without altering any circumstances that could affect that behavior. Then, during a second phase, he schedules some alteration in the environment and takes several more observations. In many investigations a third stage is programed, the purpose being to determine whether the effects, if any, realized in the second phase, were attributable to the scheduled alteration.

Such a research strategy is direct in that the behavior selected for study is measured. If the behavior is reading orally from a Ginn reader, words read are directly measured. There is no interest in obtaining an indirect score from an achievement test.

This latter research strategy is continuous in that many observations are generally obtained throughout each phase of an investigation. Analysis is based on a number of observations, both prior to and during treatment, instead of only before and after treatment impressions. Thus, the investigator has reliable data about the capabilities of the student before instruction starts. By continuously measuring the student's behavior during the teaching period, the researcher or teacher is able to detect at which point learning begins to occur, or when mastery is realized.

Finally, research conducted in the applied behavior analysis framework is individually relevant. When treatment variables are imposed, the researcher is able to analyze the precise function of a program or set of procedures for each participant, and consequently, his conclusions and recommendations are individually relevant.

At the Curriculum Research Classroom of the Experimental Education Unit (EEU), University of Washington, applied behavior analysis techniques are being used to investigate curriculum materials and instructional procedures. In addition to applying the principles of behavior analysis--direct and continuous measurement that is individually pertinent--attempts are under way to develop a conceptual framework for the systematic investigation of curriculum. If those materials and procedures that constitute curriculum are to be thoroughly investigated, we believe that some organizational schema must be followed.

In reviewing current curriculum research, Popham (1969, p. 322) elected to schematize curriculum investigations on the basis of treatment variables. His outline contained eight divisions:

1. Organizers--the type of instruction provided the learner prior to instruction.
2. Relevant Practice--the amount of practice required to master a task.
3. Knowledge of Results--the function of the learner's knowing how he performed.
4. Promoting Learner Interest--the function of pupil motivation on skill acquisition.
5. Prompts--the degree to which prompts are useful in the design of curricular materials.

6. Multiple Channels--the effects of multimedia presentations on pupil learning.
7. Sequencing--the effect of instructional sequence on rate of learning.
8. Pacing--the effects of presenting materials to subjects at varying rates.

Part II: A Research Framework

At the Research Classroom of the EEU a research framework has been established that differs from that suggested by Popham. Although our research categories are not mutually exclusive and certainly are not rigidly determined, they do serve to delineate certain types of educational research. Currently, this framework is composed of five categories.

1. Comparison of Programs--the continuous analysis of a pupil's performance on two or more related commercially developed programs; e.g., two basal reading series.
2. Comparison of Procedures--the analysis and comparison of two or more instructional methods or procedures; e.g., teaching word recognition via sight versus the phonics approach.
3. Manipulation of a Programed Event--the function of manipulating some circumstance which is not contingent on a pupil's performance rate, e.g., pacing, sequencing, multiple channels, prompts, "high interest" material, knowledge of results, practice, instructions.[1]

4. Manipulation of an Arranged Event--the effects of manipulating some event contingent on pupil behavior, e.g., points for correct answers, free time or another privilege for correct work, pupil correction of each incorrect response.
5. Generalization--the extent of development of an untaught but measured skill when another related skill is taught; e.g., when division and renaming fractions are both measured, but only division is taught.

The following are examples of research projects in each of the five areas. These projects were conducted either by the Research Classroom staff at the EEU or by graduate students in education who received some of their training under personnel in the Research Classroom.

Comparison of Programs. The project described here involved the comparison of three readers. The teacher who conducted this study selected two basal readers and a "high interest, low vocabulary" text. The basal readers were the Lippincott 2^2 reader (1964), the Allyn and Bacon 3^1 reader (1965), and Submarine Rescue (1959), published by Harr Wagner. The reading level of the last book, according to the publisher, was third grade level.

Each day the pupil read from the three books for five minutes. He first read from the Lippincott reader, then from the Allyn and Bacon book, then from Submarine Rescue. The instructional procedures were the same from day to day for all books. If the child mispronounced or did not attempt to pronounce a word, he was told that word. No further instruction, confirmation, or feedback was provided.

Both correct and error rate data were obtained. After each reading the teacher counted the number of correctly and incorrectly pronounced words and divided each total by five. Errors consisted of substitutions, omissions, and additions. Repeated words were not counted as errors.

The pupil's performance in the three books was almost identical; his correct and error rates were virtually the same. The largest correct and error rate ranges, however, were associated with the high interest, low vocabulary book. The correct rate ranged from 33.6 to 61.6, while errors varied from 2 to 4.5.

Figures 1, 2, and 3 about here

The correct and error rate medians on the charts refer to two-week periods, not different phases. In the Harr Wagner book, for example, the pupil's correct rate medians for three consecutive two-week periods were 40, 45, and 47.3 words per minute.

It may be noted that even with minimal instruction--five minutes of reading and the correction of errors--the pupil's reading proficiency improved in all three series. In the Harr Wagner book his correct rates went from 40 to 47.3, while his errors dropped from 2 to 1.4. Similar improvements in the Lippincott and Allyn and Bacon readers are illustrated in the figures.

Readability indexes according to the formula of Edward Fry (1969) were run for the portions of the three readers the pupil had read. This index was 4.5 in the Lippincott reader, 4.0 in Allyn Bacon, and 3.5 in Harr Wagner. For this boy, reading rate was apparently not related to readability, since correct and error rates in the three series were very close.

A final note should be added pertaining to interest and reading rate, although analysis of this factor was not the objective of this study. It may be noted that interest is individually relevant and cannot necessarily be determined by publishers. For example, the reading rates from the Lippincott and Harr Wagner books were identical, yet in terms of difficulty they were one year apart. The teacher noted that the pupil was more interested in the Lippincott stories, as they were about cowboys and Indians, than in the other stories. It appears then, that interest can be a critical variable in the teaching of reading, but the determination of what is interesting can be better dealt with by the pupil than by the publisher.

Compare Teaching Procedures

Figures 4, 5, 6, and 7 illustrate the data from a reading project where two approaches to the teaching of phonics were compared--the Slingerland[3] (1969) and the Palo Alto methods (1968). Correct and error rates were obtained from two boys on their abilities to identify initial consonant and medial vowel sounds. The teacher first read a list of cvc words to the boys and they were requested to write the initial consonant sound; then, as another cvc list was read, to write the medial vowel. Throughout the first phase of the project only minimal teaching was provided. If the pupil wrote down an incorrect letter or did not respond, he was told the letter. Then, in the second phase of the project, phonics teaching began. The Slingerland phonics method was used for one boy while the Palo Alto phonics technique was used with the other. Equal instruction time was provided both boys.

The instructional steps employed for the Palo Alto technique were: (a) present a letter, show a picture beginning with that letter, ask the pupil to name other words beginning with that letter, ask the pupil to write the letter (initially the letters a, m, r, and t were taught); (b) construct words using these letters, such as "ram," "am," "tam;" (c) present sight words "I" and "the," then phrases such as "Am I," "I am," "the ram;" (d) teach other letters and sounds.

The Slingerland procedures were as follows: (a) present "key word" cards which consisted of upper and lower case letters with a picture of the particular letter; discuss letter and sound; (b) establish a pattern for letters and sounds (name letter, key word representing that letter, letter sound); (c) write letter in the air while pronouncing it, then say key word, then sound; (d) analyze, with same techniques, simple cvc words as rug, bag; (e) practice synthesizing (putting together sounds) words like rug.

During the first phase of the project the "Palo Alto" boy's correct and error rates in identifying medial vowels were 5 and 3 per minute (Figure 4). When instruction was programed throughout the next phase, his rates were 18 and 0. His first phase rates in identifying initial consonants were 8 and .7, and 16.6 and 1 when training was introduced (Figure 5).

Figures 4 and 5 about here

Throughout the first phase Jimmy, the "Slingerland" subject, had a median correct rate and error rate of writing medial vowels of 2.8 and 3 (Figure 6). During this pre-instruction phase his median rates for identifying initial consonants were 5.6 and 1.8 (Figure 7). Following this initial measurement phase, when Slingerland instruction was offered, his median rates in the median vowel program were 7 and .4, and, in writing initial consonants, 15.4 and .2.

Figures 6 and 7 about here

Both phonics approaches were effective. For the Palo Alto boy, the correct rate median in the consonant program rose from 8 to 16.6 while the correct rate median in the vowel program advanced from 5 to 18. Meanwhile, the median rates of the boy receiving the Slingerland instruction went from 5.6 to 15.4 in the consonant program and from 2.8 to 7 in the medial vowel program.

Manipulation of a Programed Event

Many projects in which a programed event is manipulated contain three phases--before, during, after. In the "before" phase, data are obtained to reveal how proficient the student is when current procedures are in effect. The "during" phase is the period during which different circumstances are arranged. The final phase, the "after" portion of the study, is scheduled to determine whether the subject's improved performance (if that is the case) in the "during" phase will continue when instruction or other training aid is removed.

In the following example, the behavior of concern was the computation of add and subtract facts of the type, 2 + 1 = [] and 3 - 2 = []. In the first phase of the project, the boy's rate was .55 problems per minute, while his error rate was 1.25 per minute (Figure 8). In this phase typical classroom procedures were in effect. Instructions were provided prior to measurement and, following the 20-minute session, his paper was corrected and returned to him.

Figure 8 about here

Throughout the second phase, the instructional procedures remained the same, except now the boy was given a number line to use to assist him in computing his problems. As the figure shows, his median correct rate was 1.55 in this phase and his error rate median was .25. The teacher, believing satisfactory performance had been obtained, decided to withdraw the number line and begin the final, or "after" phase, of the project. The boy's correct rate median continued to accelerate, while his error rate median decelerated. However, the data also reveal that errors began to appear, which could be a signal to reinstitute the number line.

The sequence of phases employed in this study--"before," "during," and "after"--is particularly useful for the evaluation of remedial techniques. Teachers often are confronted with pupils who require something extra or different in order to learn--more instruction, a change of precedures, altered material. Teachers who scheduled these remediation devices must first be assured that the resulting change is effective--that the child's performance has been positively altered. Second, the teacher who used a remediation aid or crutch to assist a learner to master some skill must eventually remove that aid. The ultimate objective for the pupil should be to behave in a more complex manner than he had prior to treatment, but without the crutch that was used during rehabilitation.

Manipulation of an Arranged Event. Arranged events are those happenings which are contingent or dependent on a pupil's behavior. For example, if a point system has been scheduled where a pupil receives one point for ten correct problems, this is an arranged event. Or, if contingent on each incorrectly spelled word the pupil is required to write those incorrect words several times, this too is an arranged event. In both cases, the event is dependent on pupil performance.

Figures 9 and 10 illustrate an example of an arranged event. Data were obtained initially on this boy's performance in phonics (Write and See program, 1968). The only arrangement in effect at this time was that his phonics lesson, along with other assignments, had to be completed before he was allowed recess. Throughout the next phase, self-scheduling was arranged. In this phase, if the pupil committed fewer than four errors, he was allowed to schedule five other activities. Two more phases, teacher-scheduling and pupil-scheduling, were alternately arranged.

Figures 9 and 10 about here

It may be noted that during the first phase of the project, teacher-scheduling, the correct rate trend decelerated, while the error rate accelerated. Throughout the second phase (pupil-scheduling), a more positive trend was noted; error trend maintained and correct rate accelerated. During the third phase of the project, when teacher-scheduling was reinstated, both correct and error rates began to accelerate, the error rate more rapidly. The data revealed that in the final phase, return to self-scheduling, the pupil's correct and error rates stabilized.

The effects of teacher- versus self-scheduling were more pronounced in the pupil's error rate than in his correct rate, presumably because the contingency, when in effect, pertained to errors. This fact is illustrated when error rate medians and trends from adjacent phases are compared. During the first teacher-schedule phase, the error rate median was .18, the trend a ×1.4.[2] These figures throughout the second phase were .08 and ×1. In the third phase, return to teacher-scheduling, the pupil's error rate median was .65, his error trend ×1.4. During the final phase, when self-scheduling was contingent on performance, the boy's error rate median fell to .35 while his error trend leveled at ×1.

The effects of teacher- versus self-scheduling are also reflected in a ratio analysis of the four phases of the project, the ratio being derived by dividing the median correct rate by the median error rate. During the teacher-scheduled phases, these ratios were 18 and 8 while the ratios throughout pupil-scheduled conditions were 31 and 15. Between adjacent phases (1 to 2 and 3 to 4), the correct to error ratios during pupil-scheduling were nearly double those during teacher-scheduled phases.

Generalization. Most "generalization" projects consist of two phases. In the first phase, two or more related academic skills are measured. In some cases no teaching is attempted during this phase, while in other instances minimal instruction is provided. In the second phase, systematic teaching procedures are directed to only one of the measured behaviors. However, all the activities are continually measured.

The example project involved certain phonics skills and oral reading. In the first phase measures of several specific phonics skills were obtained. Daily, correct and error rates pertaining to medial vowels, initial consonants, digraphs, and consonant blends were procured. Figure 11 presents data from one phonics area, writing short vowels. To obtain these data, the instructor read a list of 20 cvc words containing short vowels--words like "pig," "dog," "cat." The pupil's task was to write the middle vowel that he heard. The instructor tallied each correct and error answer, and, at the end of the session, calculated correct and error rates per minute.

Figure 11 about here

Throughout the first phase of this project (when no instruction or feedback of any kind was provided) data were also obtained daily for five minutes as the pupil read from a non-phonics reader (Ginn, 1961) and a phonetically based text (Lippincott, 1966). The instructor counted the number of correctly and incorrectly pronounced words and, at the end of each session, calculated oral correct and error rates per minute.

Throughout the second phase of the project, phonics instruction was provided. Before the phonics or oral reading measurements were taken, the instructor scheduled a 5-minute phonics session based on the Slingerland phonics drills. For example, when taught the short "a" sound, the pupil was first instructed to say the letter name, then say a word (apple) associated with the short "a." The child was next taught to "draw" the a in the air. When these associations were developed, he was instructed to run off the chain; "ā, apple, ă," and simultaneously draw the a in the air. A similar sequence of behaviors was provided for the other short vowels.

The results of this project revealed that during the first phase the pupil's correct and error rates of writing short vowels steadily accelerated (Figure 11). His median correct rate in this phase was 18 while his error rate median was 1.3 per minute. In the second phase, when instruction was provided, his correct rate continued to accelerate while his errors were totally extinguished. His correct and error rate medians in this second phase were 38 and 0.

Meanwhile, in the Ginn reader (Figure 12) the pupil's correct and error rate medians during the first phase were 70 and 3.2 words per minute. Throughout the same phase, his correct and error rate medians in the Lippincott reader were 62 and 4.2 words per minute (Figure 13).

Figures 12 and 13 about here

The dotted lines on the two reading charts indicate that a change (phonics instruction) had been programed, but was not directly related to the pupil's oral reading performance. Throughout the second phase in the Ginn reader, his correct rate median was 80 words per minute while his error rate median dropped to 1.8. In the Lippincott series his correct rate median was 80 and his error rate median, 2.3.

That phonics training affected the pupil's performance in phonics was obvious since his correct rate median in writing short vowels doubled from the pre-treatment to treatment phase and, once instruction began, his errors were eliminated. Moreover, the pupils performance in the other phonics skills was greatly improved from first to second phase. More noteworthy, however, were the generalized effects of phonics instruction on reading. The figures show that the pupil's performance in both the Ginn and the Lippincott readers improved. However, the phonics treatment seemed to generalize more to the "phonics" reader (Lippincott) than to the "non-phonics" reader (Ginn). When correct and error rate comparisons between the two readers were made, the differences in the median scores across conditions were greater in the Lippincott than in the Ginn reader. The pupil's correct rate change from phase 1 to 2 in Lippincott was 18, while it was only 10 in the Ginn. Similarly, his median error rate change across conditions in the Lippincott was 1.9 compared to a 1.4 change in the Ginn book.

Part III: Designing a Curricular Research Methodology

The forming of a research system, whether for the military, industry, or education, involves three major factors. Of primary consideration should be the development of a measurement system--a calibration unit which is most appropriate. A second consideration could be the development of a conceptual framework--identifying specific research categories. The third factor might be the development of research designs to assist researchers to obtain reliable and credible information.

The second consideration, formulating a conceptual framework for categorizing and conducting educational research, has been dealt with in this paper. Although the first and third methodological factors--the development of a measurement system and a network of research designs, are not discussed here, a few comments relevant to both issues are perhaps not out of place at this time.

Throughout this paper, rate per minute was selected as the measurement unit. In fact, two rates were always presented--correct and error rates. The question--Why should rate be used to interpret academic performance?--is often posed. Educators are generally concerned, or should be, with three dimensions of a pupil's academic performance: (a) frequency--how many right and wrong answers, (b) quality--what the correct to error ratio is, and (c) time--how long it took to perform the task.

By using rate, correct and error, as the unit to measure academic behavior, the teacher is provided with all three items of information. First of all, once the rate has been determined, the teacher has information regarding the frequency of answers and the time the pupil took to do them. These two figures are automatically available, since rate is determined by dividing frequency by time. When correct and error rates are simultaneously collected, the teacher also has a quality index in the form of both a ratio and a percentage. For example, if a student's correct rate on a given day is 8, while his error rate is 2, his correct to error ratio is 4 (8 ÷ 2). At the same time, his percentage correct is 80% (8 ÷ 10).

Concerning the matter of design, the traditional "reversal" and "multiple baseline" techniques will not, at least as currently interpreted, always suffice as frameworks for the analysis of curricular materials. Characteristically, the ABA design is used to demonstrate experimental control by measuring a behavior in its natural state, then introducing a new variable, and then, in the third phase, returning to initial circumstances. If the behavior in the second condition shows any alteration from the initial phase, and if, during the final phase, the behavior pattern resembles that of the original situation, the behavior has been reversed. Furthermore, the examiner can, with some assurance, state that the manipulated variable was an important factor in controlling the measured behavior.

Besides serving to demonstrate experimental control, a three-phase project in education can assist the researcher to measure the acquisition and maintenance of behavior. In Figure 8, for example, the current state of performing math problems was measured during the first phase. Throughout the second phase a number line was introduced, and the resultant performance in this phase was superior to that in the first phase. A third stage was then scheduled, at which time the variable imposed in the second phase was removed. The purpose of this phase was not to demonstrate that experimental control had been isolated, but to ascertain whether the teaching aid was no longer required to maintain performance. Obviously, a new skill had been acquired under one set of conditions and maintained in another.

If the experimenter's objective is to establish the accelerating effects of the number line on math performance, he could successively impose this aid on a series of classes of arithmetic problems (Lovitt & Curtiss, 1968). However, even if the number line is not effective with progressively more difficult math problems, that does not mean that something other than the number line was responsible for the initial behavior change. The variable could be influential on only a simple response but is nonfunctional for topographically similar but more complex behaviors.

An ABA design, as traditionally interpreted, can serve an important function, however, if the investigators stabilize and simplify the curricular materials. If the researcher's concern is primarily to ascertain the effects of some situational variable, while the pupil's acquisition of more complex behaviors is of secondary concern, the use of known or easy materials (Lovitt and Curtiss, 1970) and an ABA design is a recommended tactic. By presenting problems to a pupil that he is capable of performing, throughout all experimental conditions, and by manipulating a situational variable, the probability of an examiner's being provided reliable data of the effects of that independent variable are high.

If, however, a pupil is asked to respond to material, only some of which is known, and simultaneously some variable such as tokens or points, is manipulated, the effects, if any, are often masked. This can be due to a pupil's performance variability either because the materials have been poorly sequenced, or because certain aspects of the program have been mastered.

A further complication for the educational researcher is that, generally, pupils respond daily on a number of educational tasks. A pupil is usually required to perform each day in reading, language arts, math, and social studies. Often the pupil is writing, reading, speaking, and using basic computation skills in a number of these independent subject matter areas. Consequently, experimental control for any one behavior is difficult to arrange.

The development of design frameworks in order to evaluate educational procedures and materials should receive high priority. Unfortunately, the designs used by applied behavior analysts to explore the function of a variety of independent variables when associated with such behaviors as talk-outs, out-of-seats, hits, tantrums, are not always sophisticated enough for academic situations.

Broadly speaking, the dependent variables of curriculum researchers are reading, writing, science, social studies, mathematics, music, and history. Meanwhile, educational researchers are concerned with such independent variables as the various teaching procedures, teaching aids, scheduling plans.

Research designs must be formulated to enable educational investigators to deal reliably with the extremely complex and relevant circumstances that make up the educational process. Furthermore, designs must be developed that encompass the many and varied performances of pupils. Unless an educational research methodology is developed that will influence the educational process, the practice of education will continue to be unimpressed by what "research says." It follows, then, that unless a methodology is designed and adopted, educational practice will continue to be directed by nonempirical means.

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FOOTNOTES

[1] All of the curriculum research categories suggested by Popham (1969) are, according to this schema, programed events.

[2] An indication of a decelerating (÷) or accelerating (×) trend. If a ×2 is indicated, this would mean that the rate is accelerating at the rate of 2 movements per minute per day.

[3] The Slingerland method is based on the Gillingham techniques. Gillingham, A. and Stillman, B. Remedial training for children with specific disability in reading, spelling, and penmanship. Cambridge, Massachusetts: Educators Publishing Service, 1956.

FIGURE LEGENDS

Figure 1. Correct and error oral reading rates in the Harr Wagner "high interest, low vocabulary book." The publisher's stated reading level of this book was 3; the Fry index was 3.5. The numerals in the teardrop indicate two-week medians. The teardrops above the data plots pertain to correct rate; those below to error rate.

Figure 2. Correct and error oral reading rate in the Lippincott reader. The publisher's recommended grade level was 2^2 while the Fry index was 4.5.

Figure 3. Correct and error oral reading rate in the Allyn and Bacon reader. The publisher's recommended grade level was 3; the Fry index was 4.

Figure 4. Correct and error rates as a boy wrote short vowel sounds. A list of 20 three-letter words (cvc) each containing one of the 5 short vowels was read by the teacher. During the first phase no instruction or feedback was provided. Throughout the second phase five minutes of phonics instruction, as recommended by the Palo Alto series, was provided prior to the phonics measurement.

Figure 5. Correct and error rates as a boy wrote beginning consonant sounds.

Figure 6. Correct and error rates as the boy wrote median short vowel sounds. No instruction was provided throughout the first phase, whereas five minutes of the Slingerland type phonics instruction preceded phonics assessment in the second phase.

Figure 7. Correct and error rates as a boy wrote initial consonant sounds.

Figure 8. Correct and error rates for a boy writing answers to mathematics problems. During the second phase the boy was allowed to use a number line as an instructional aid. He did not use the number line in the first and final phases. The horizontal broken line extending from .05 indicates that each session lasted for 20 minutes (1 ÷ 20 = .05).

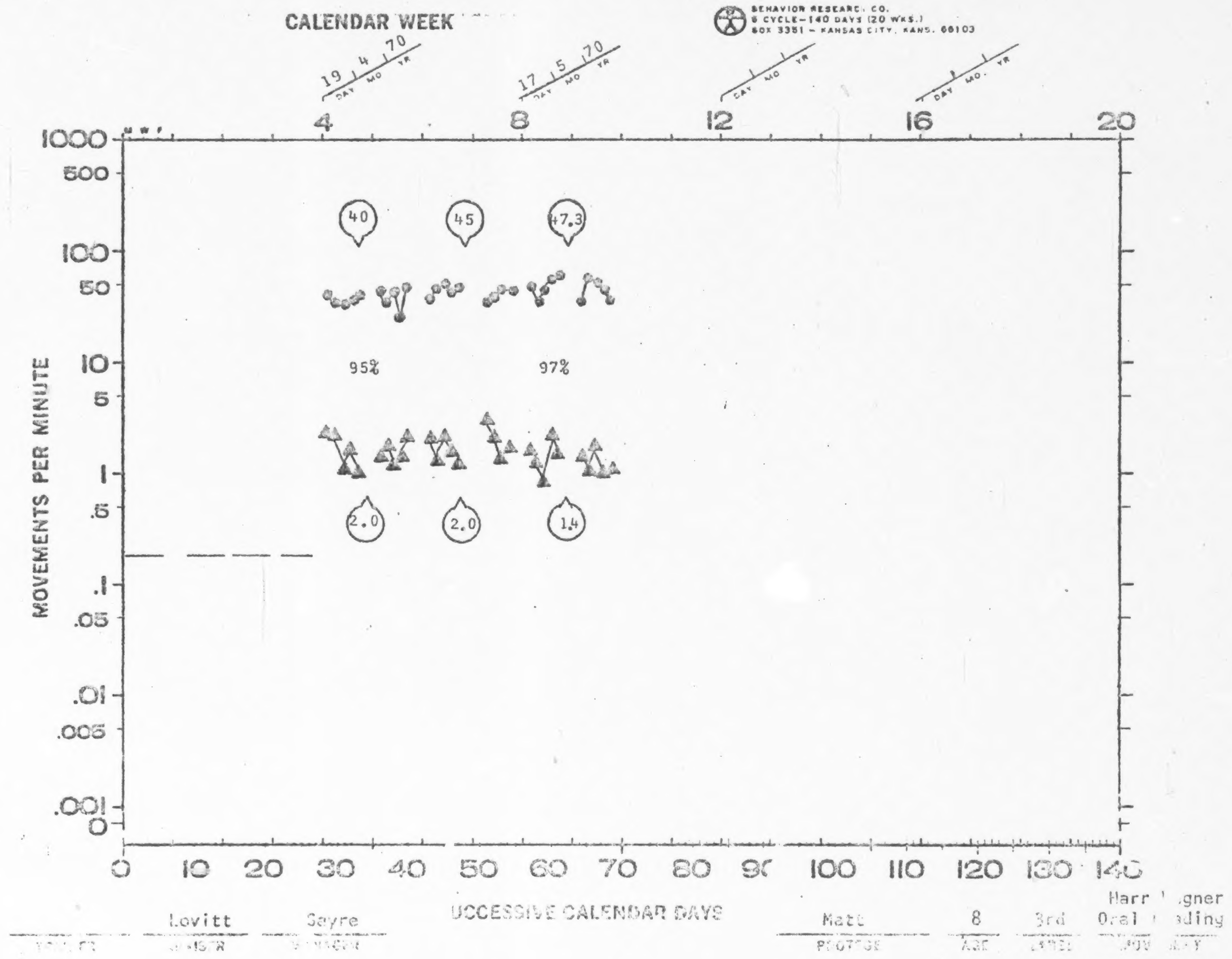
Figures 9 and 10. Correct and error rates as a boy wrote answers in the "Write and See" phonics program. In phases 1 and 3 the teacher scheduled all of the boy's program. In phases 2 and 4, scheduling was contingent on performance. If fewer than four errors were committed during the phonics period, the pupil could arrange the scheduling of five other academic programs.

Figure 11. Correct and error rates as a pupil wrote medial short vowels when a list of cvc words was read by his teacher. No instruction was provided during the first phase. Five minutes of

phonics instruction, according to the Slingerland method, was scheduled throughout the second phase of the project.

Figure 12. Correct and error rates as the pupil read orally from a Ginn second reader. The dotted line indicates that a change in the overall program has been scheduled, but that the change is not directly related to this particular behavior--reading from the Ginn book.

Figure 13. Correct and error rates as the pupil read orally from a Lippincott second reader.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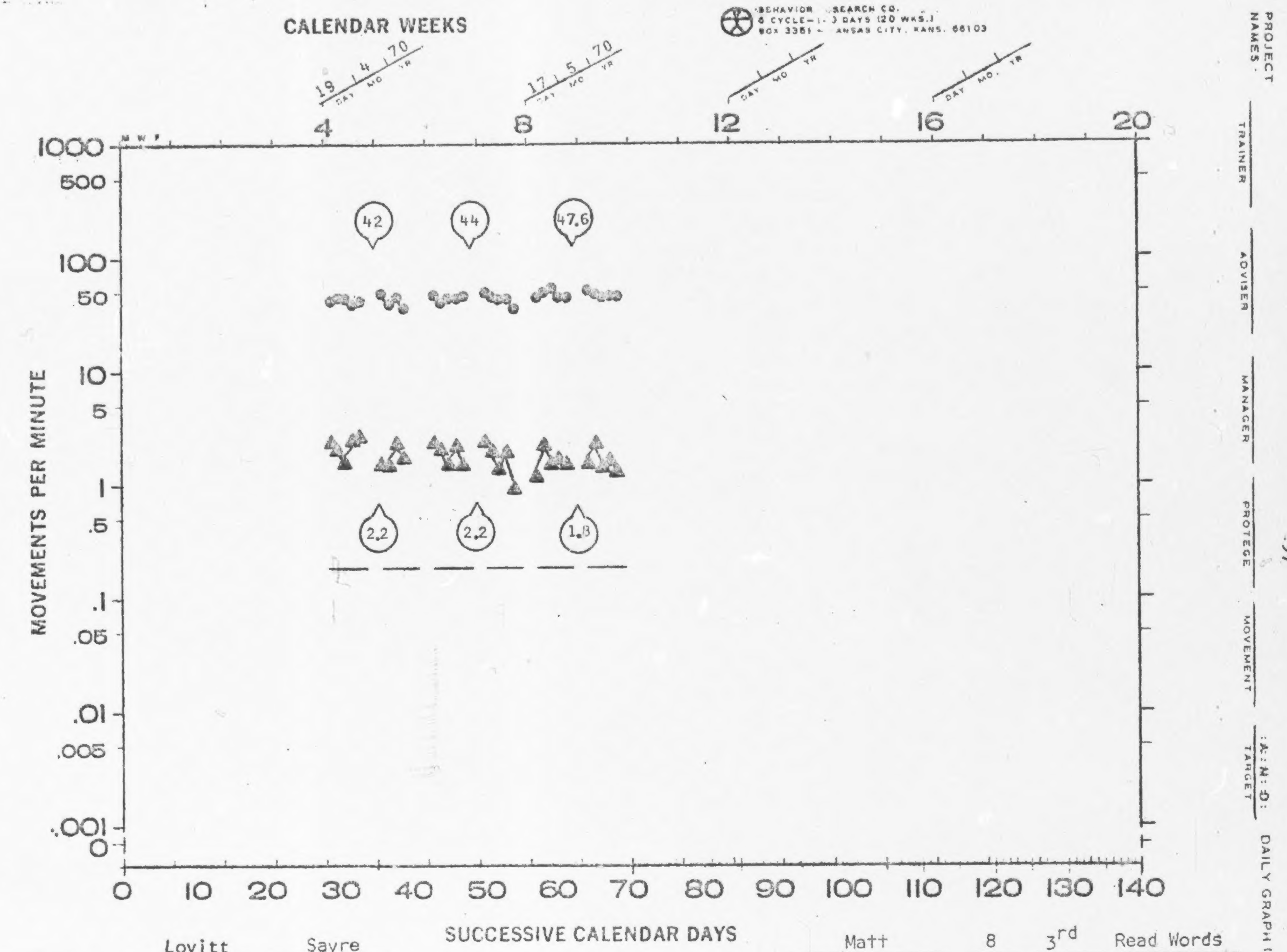

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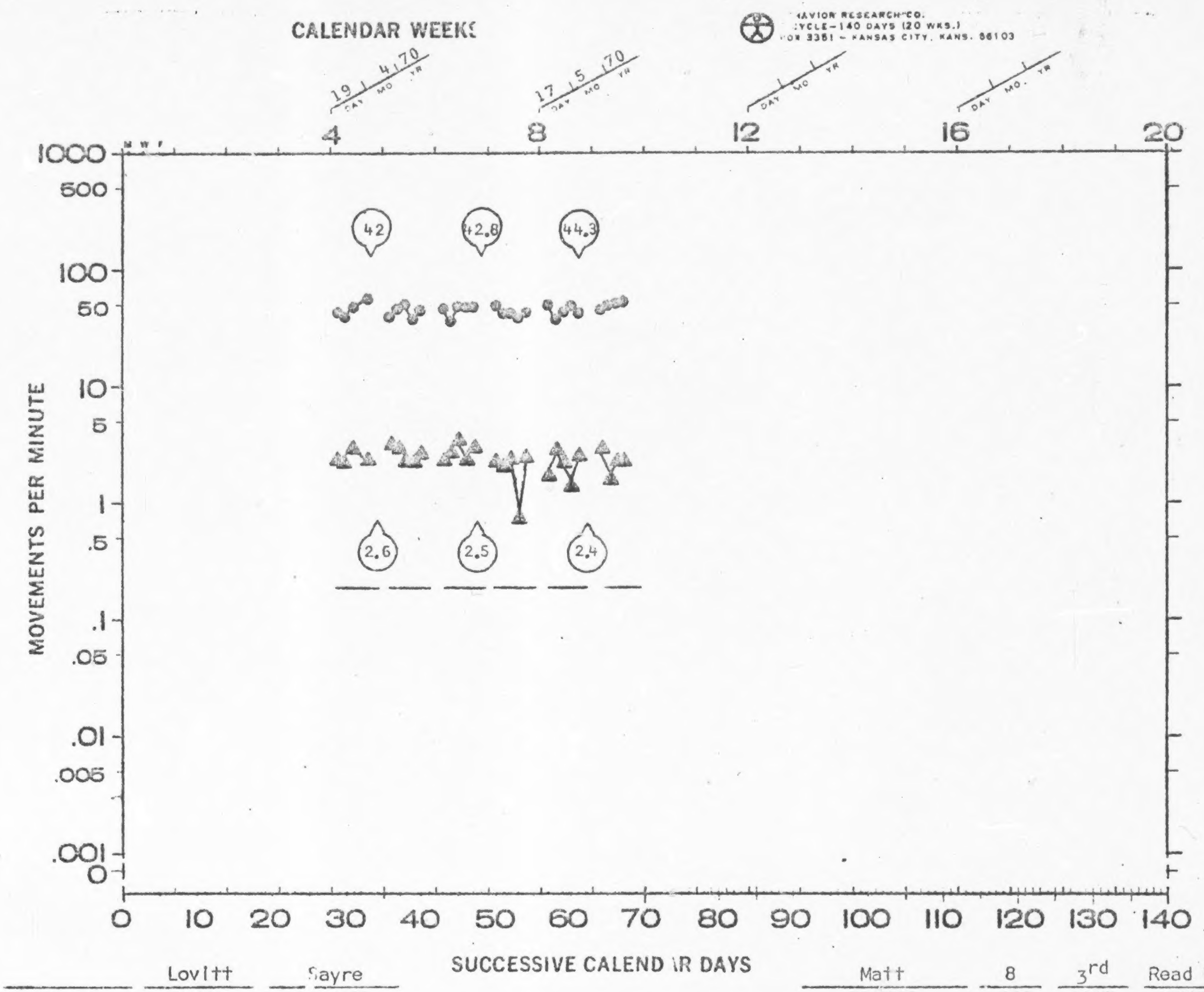

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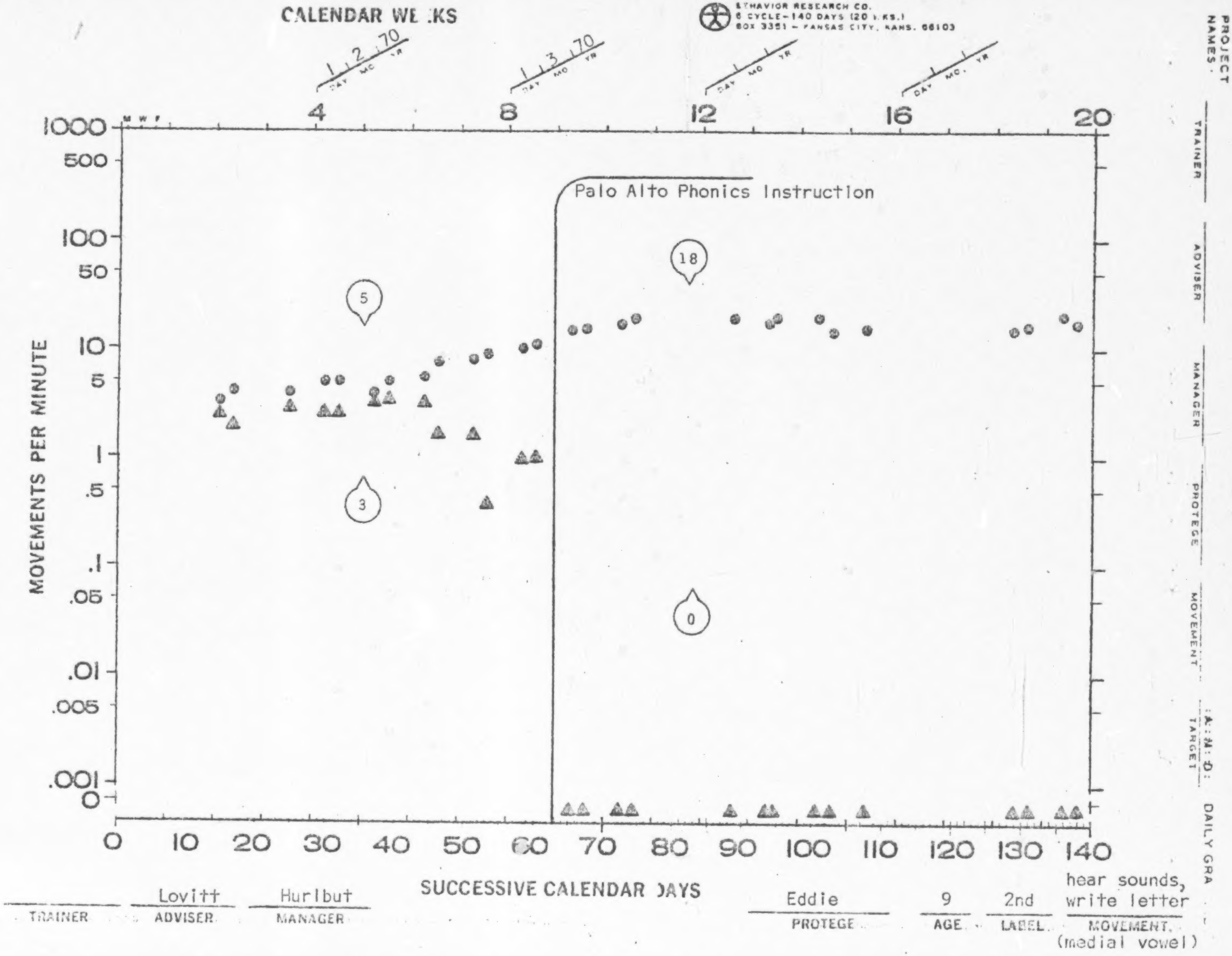
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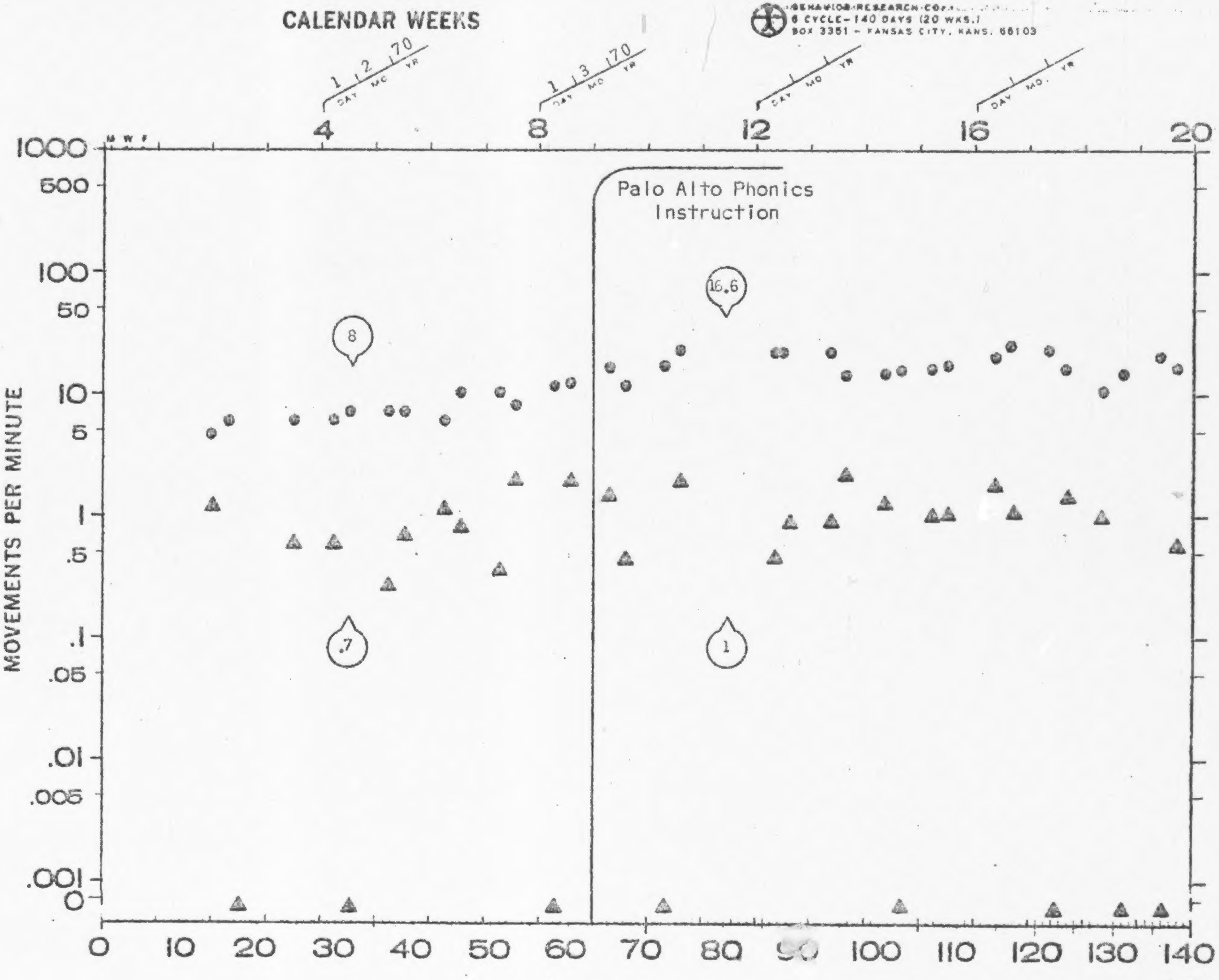

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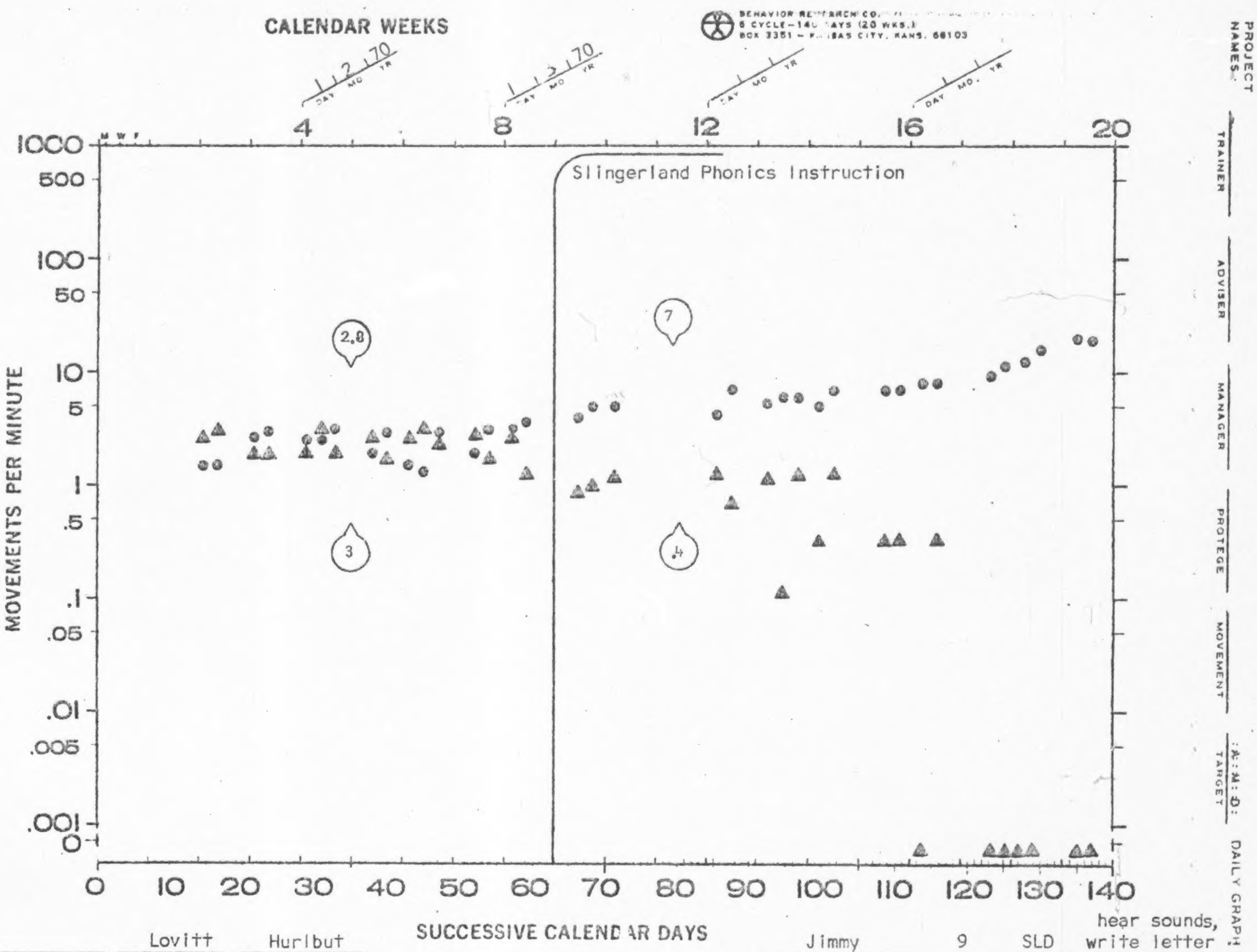

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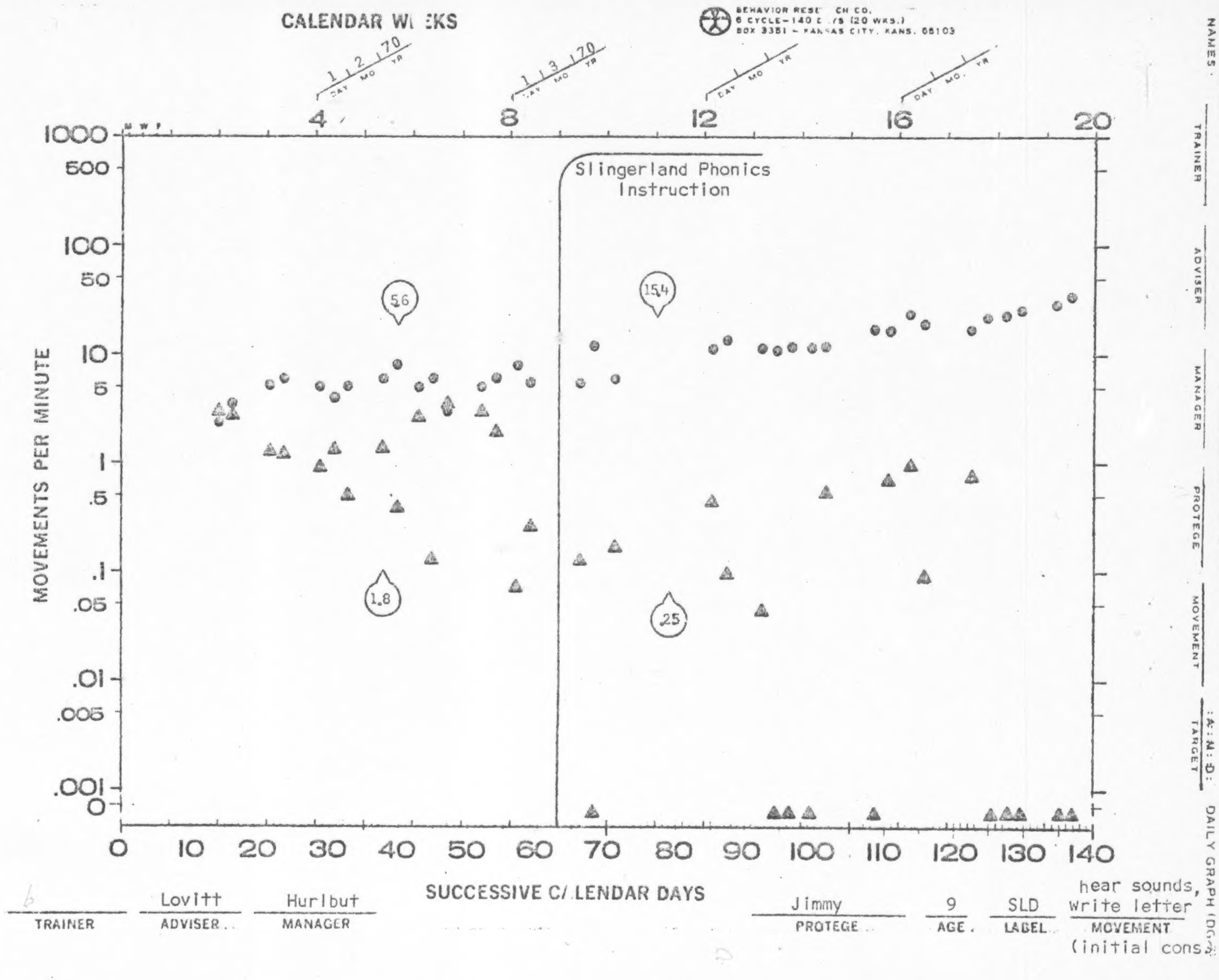

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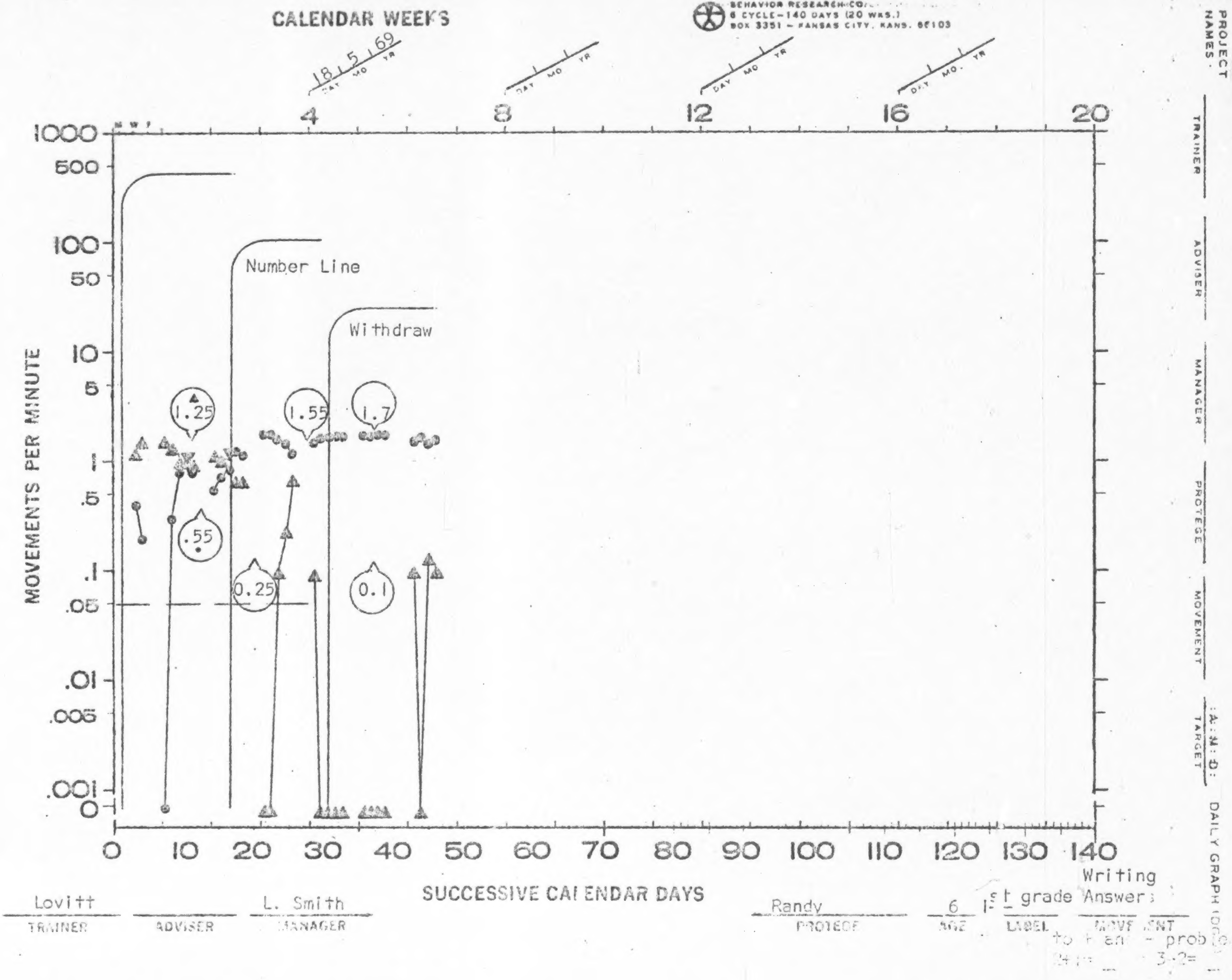CALENDAR WEEKS
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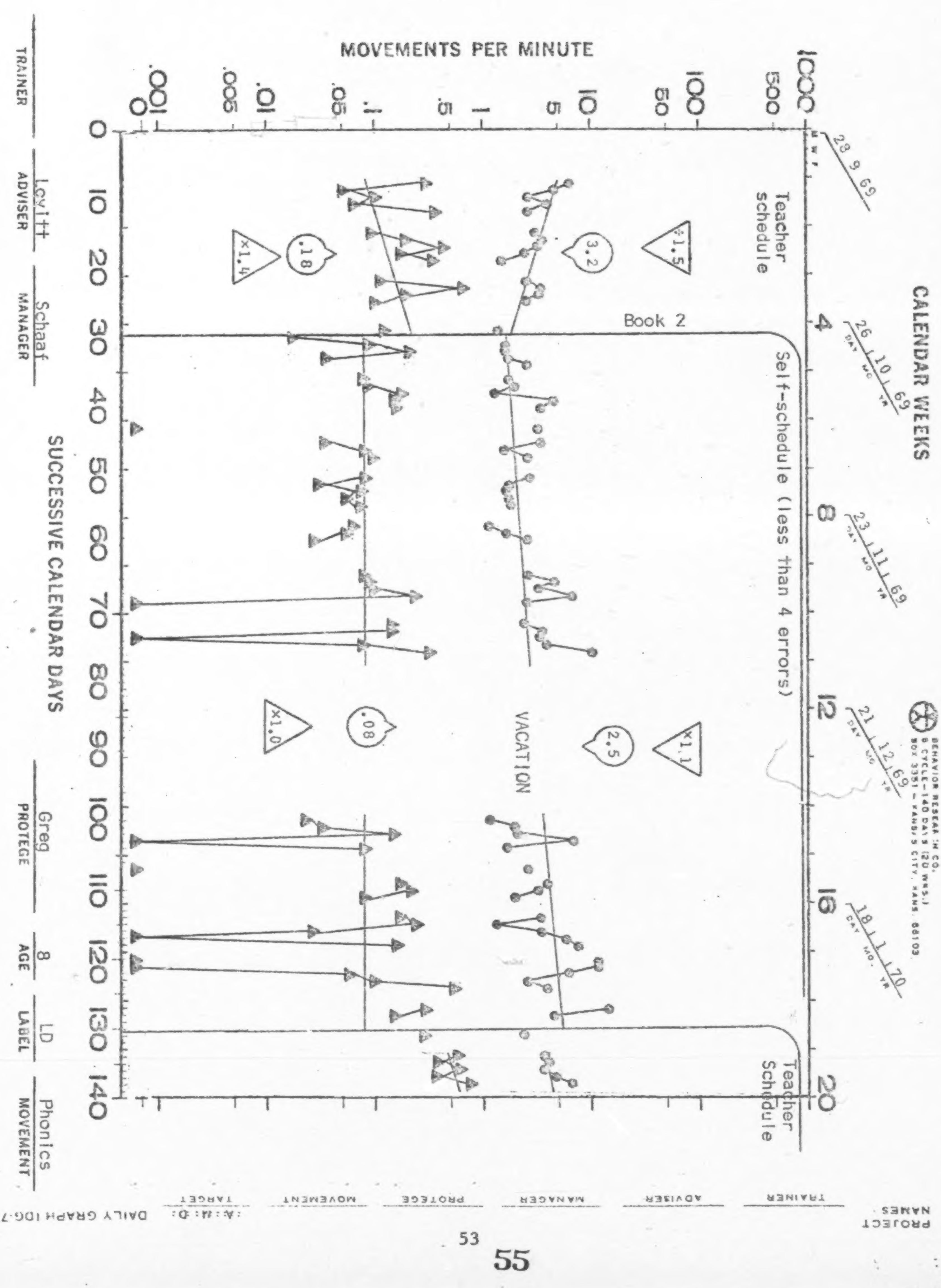
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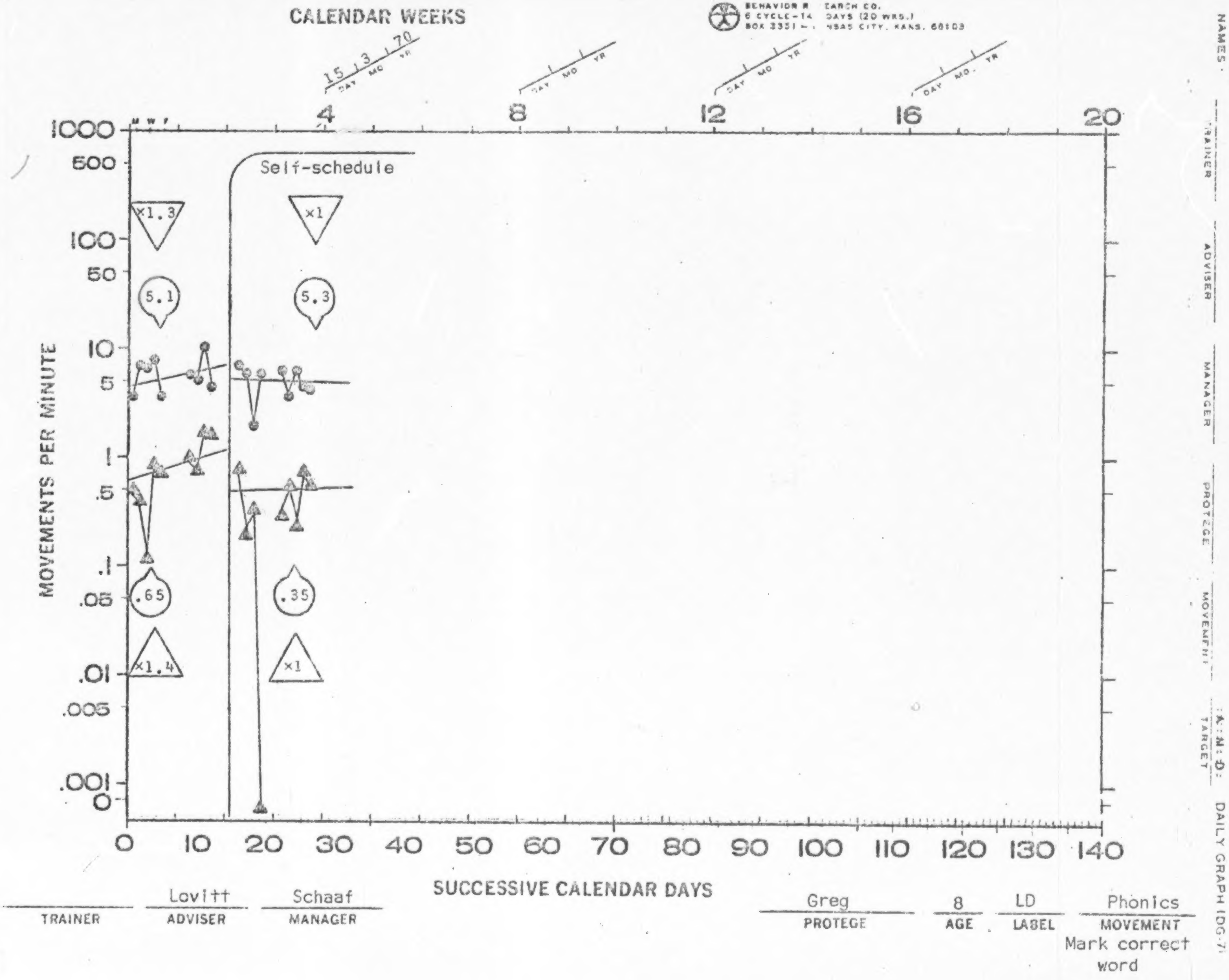
SUCCESSIVE CALENDAR DAYS
TRAINER
Lovitt
ADVISER
Schaaf
MANAGER
Greg
PROTEGE
8
AGE
LD
LABEL
Phonics
MOVEMENT
PROJECT NAMES
TRAINER
ADVISER
MANAGER
PROTEGE
MOVEMENT
TARGET
:A:M:D:
DAILY GRAPH (DG-7)

CALENDAR WEEKS
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BEHAVIOR R[illegible]ARCH CO.
6 CYCLE-14 DAYS (20 WKS.)
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SUCCESSIVE CALENDAR DAYS
TRAINER
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Greg
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Phonics
MOVEMENT
Mark correct word
PROJECT NAMES:
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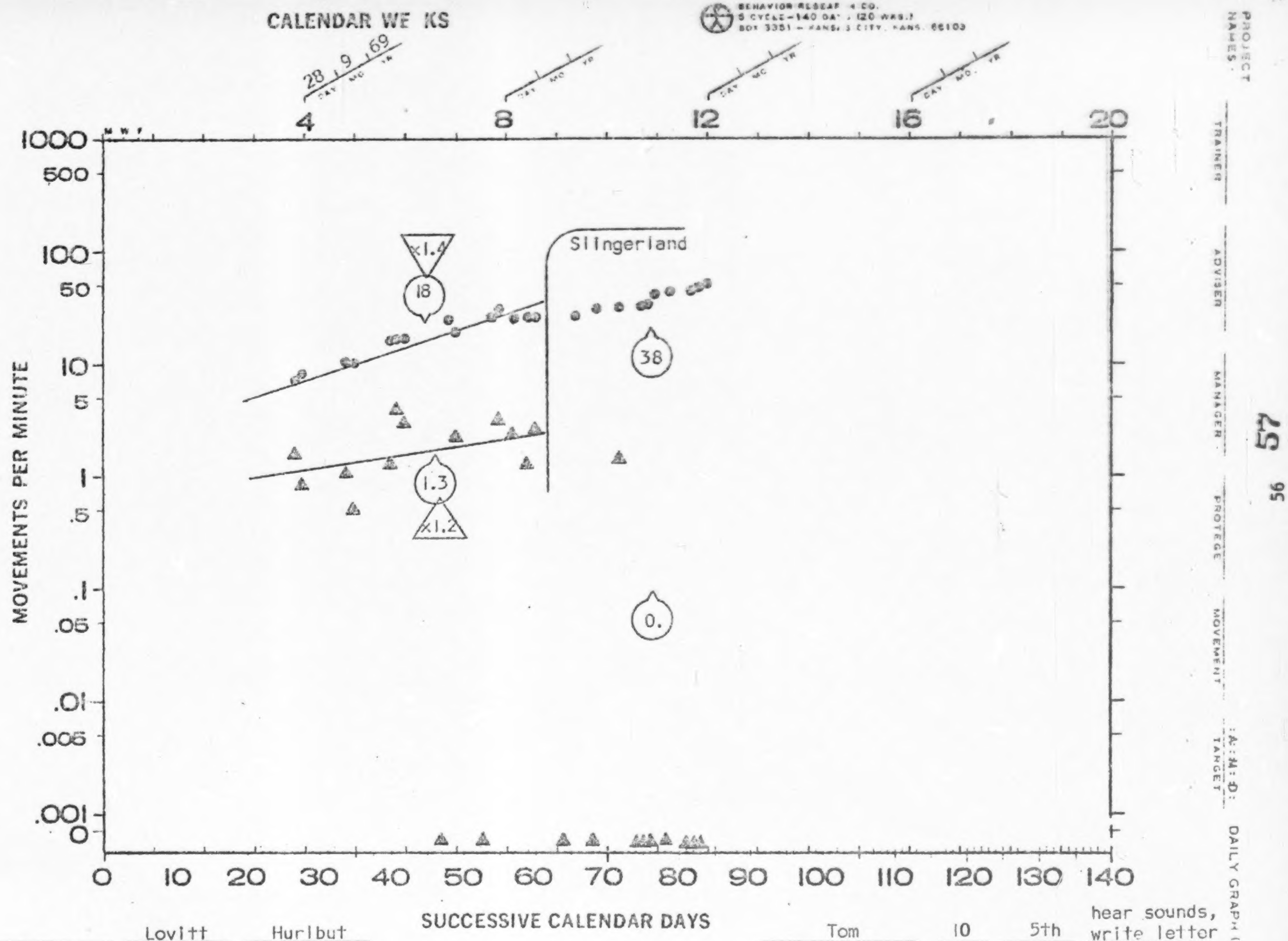
TARGET
DAILY GRAPH (DG-7)



TRAINER

Lovitt
ADVISER

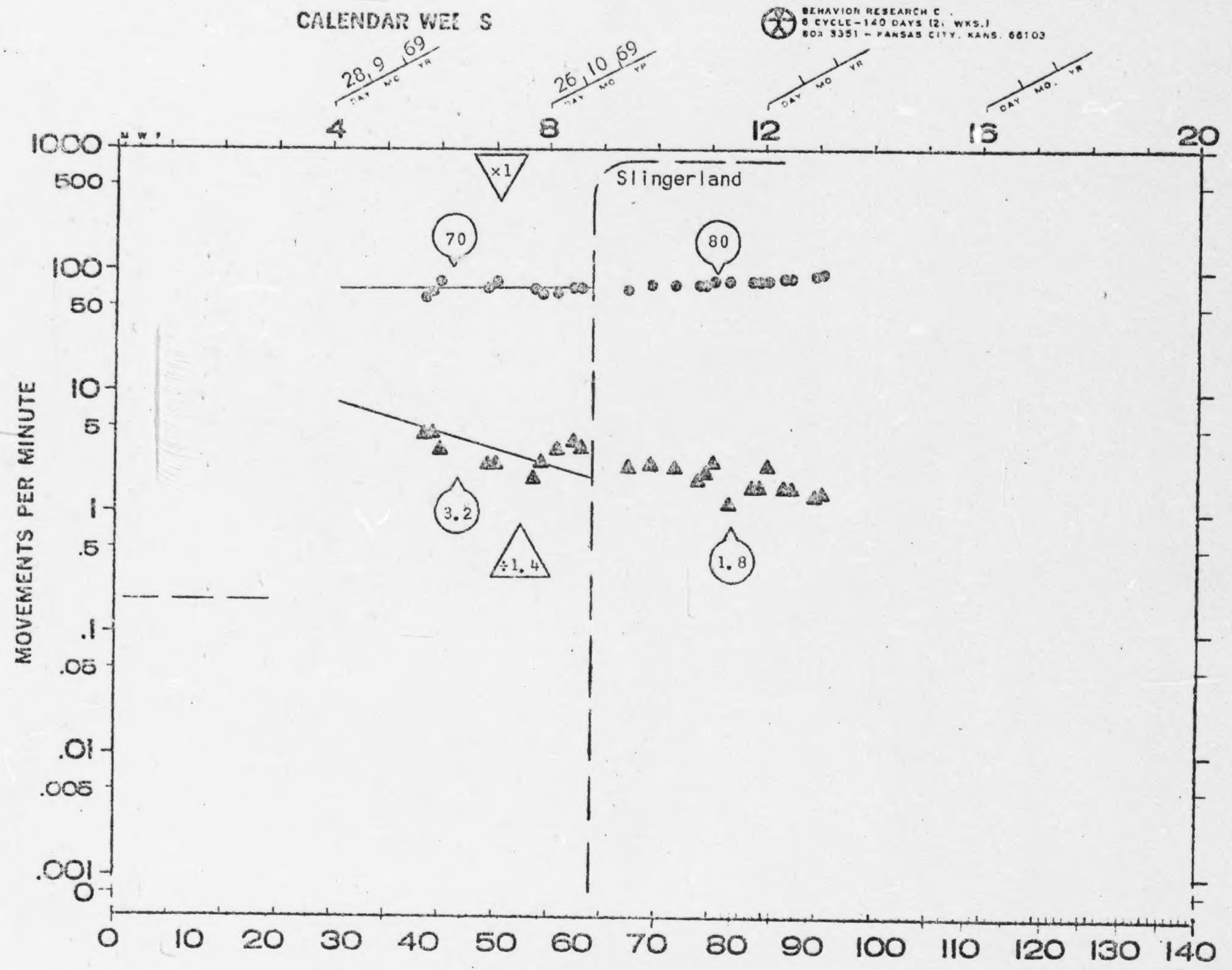
Hurlbut
MANAGER

Tom
PROTEGE

10
AGE

5th
LABEL

hear sounds, write letter (medial vowel)
MOVEMENT



Lovitt
ADVISER

Hurlbut
MANAGER

TRAINER

Tom
PROTIGE

10
AGE

5th
LABEL

Read words Ginn 2^2
MOVEMENT

PROJECT NAMES·
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ADVISER
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PROTEGE
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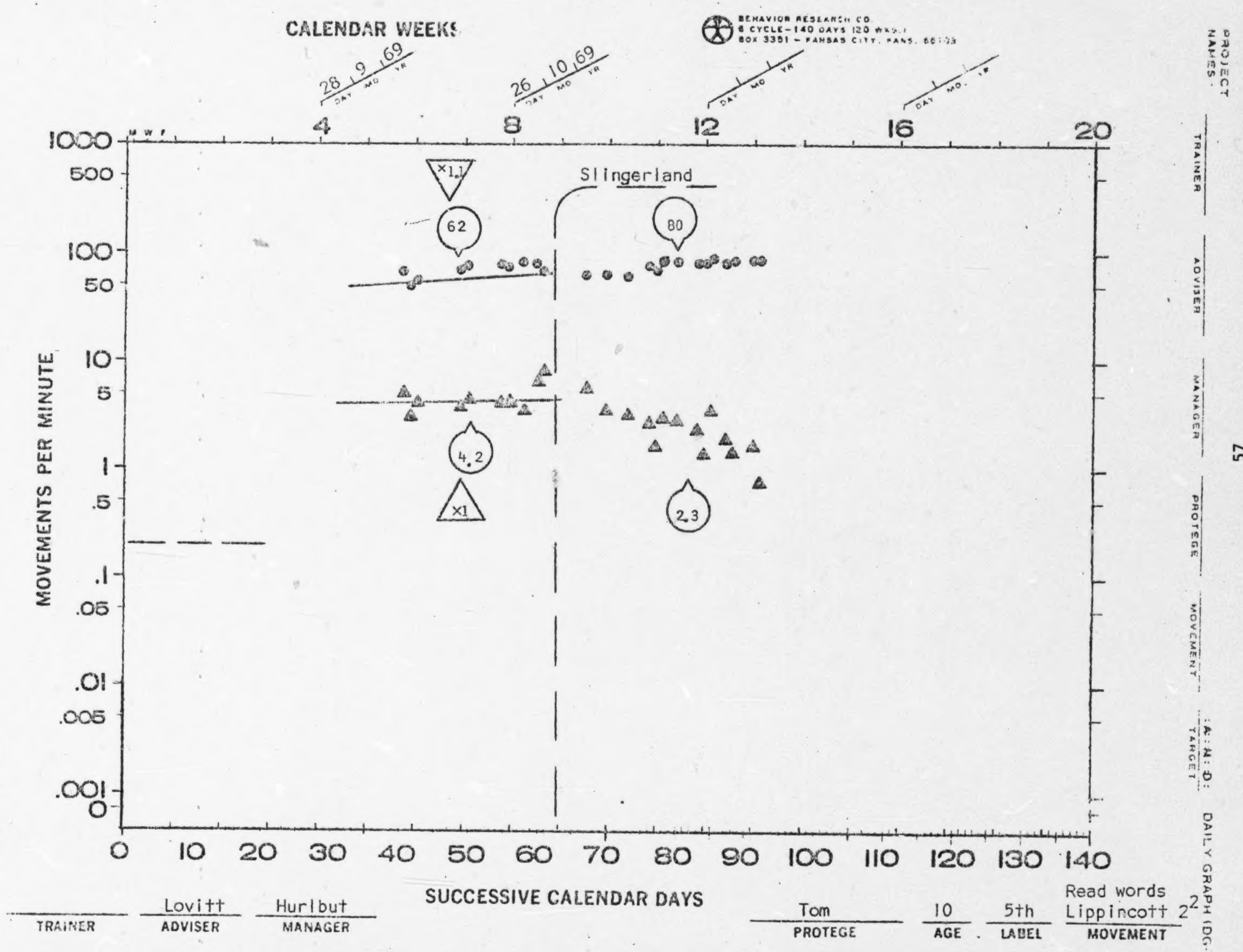
TARGET
DAILY GRAPH (DG-7)


CALENDAR WEEKS
BEHAVIOR RESEARCH CO.
6 CYCLE–140 DAYS 20 WKS.
BOX 3351 – KANSAS CITY, KANS. 66103
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SUCCESSIVE CALENDAR DAYS
TRAINER
Lovitt
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Hurlbut
MANAGER
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PROTEGE
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5th
LABEL
Read words Lippincott 2²
MOVEMENT
PROJECT NAMES:
TRAINER
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MANAGER
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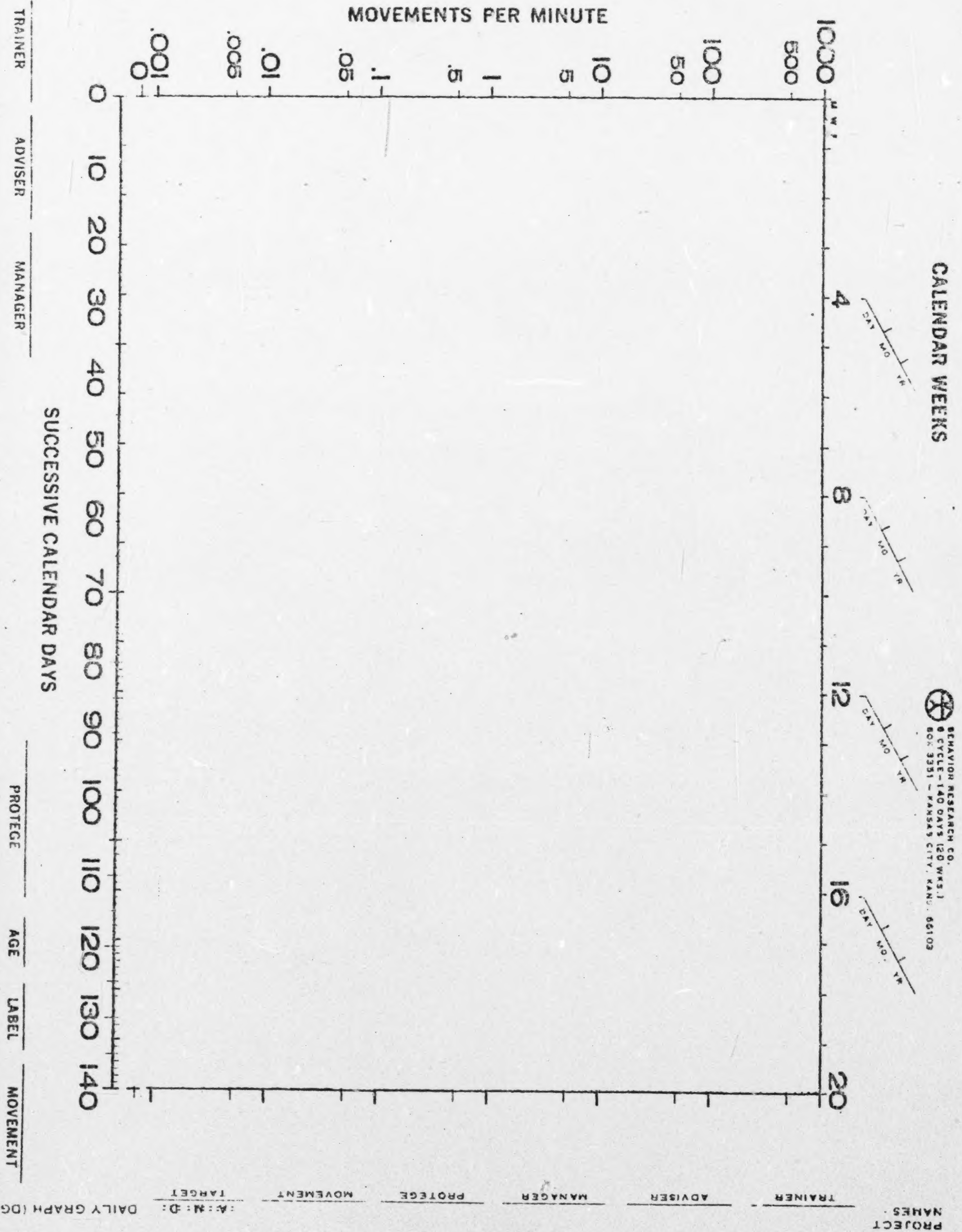
DAILY GRAPH (DG-7)


MOVEMENTS PER MINUTE
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CALENDAR WEEKS
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SUCCESSIVE CALENDAR DAYS
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MANAGER
PROTEGE
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LABEL
MOVEMENT
BEHAVIOR RESEARCH CO.
6 CYCLE–140 DAYS (20 WKS.)
BOX 3351 – KANSAS CITY, KANS. 66103
PROJECT
NAMES:
TRAINER
ADVISER
MANAGER
PROTEGE
MOVEMENT
TARGET
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DAILY GRAPH (DG-7)

Dr. Clyde Shepherd

KEENE STATE COLLEGE
KEENE, N.H. 03431

THE SPECIAL EDUCATION RESOURCE ROOM

Much progress has been made in refining diagnostic techniques to determine and identify characteristics of children relevant to school learning. Also many new instructional materials have been published which provide the special educator with resources for planning and implementing individualizediinstruction. The Instructional Materials Center network (see Exceptional Children, December, 1968, Vol. 35 #3 for a description of the IMC network) has made these materials available to most special educators. A continuing problem is the translation of diagnostic data into effective programming. In specific and rather narrowly prescribed areas, educational prescriptions can be written directly from assessment data. An integrated approach to diagnosis and practice represents the prototype of individualized education of the future. The concept of diagnostic teaching in which assessment is continuous, as advanced by Rosenburg (1968) will provide for more creative care for exceptional children. Programmed instruction, utilizing branching programs and implemented with the aid of computers, ultimately can provide countless variations of techniques matched to the particular learning characteristics pf specific children. Until such instruction becomes standard, broader use of less comprehensive yet progressive arrangements will allow for more individualized instruction. Such procedures as ungraded primaries, programmed texts, team teaching and structured pre-school programs, and broader use of ancillary specialists such as remedial reading teachers can do much to assure every child's success and will facilitate progress toward complete individualization of instruction for all children.

One such innovative arrangement which has been widely implemented across the country during the past four years is the special education resource room. This arrangement has taken many forms, depending primarily upon the characteristics of the educational system in which it has been implemented and secondarily upon the understandings and skills of those who have established the rooms. Presently, there is a need to integrate the literature on resource room organization and implementation so that those planning to develop resource rooms have more adequate guidelines.

The philosophical bases which set the criteria for educational decisions within the resource room include:

1. That all children of elementary school age should be educated within their neighborhood school.
2. That traditional educational objectives, e.g., self realization humahuman relationships, economic efficiency and civic responsibility are appropriate for all children.
3. That even "normal" children manifest differential developmental profiles having implications for individualized planning in specific areas.
4. That "exceptional" children manifest educationally "normal" characteristics in specific areas.
5. That association with "normal" children has a normalizing effect on "exceptional" children.
6. That flexible procedures for deployment of children to areas, equipment and personnel are necessary.
7. That the teaching staff as a unit share the responsibilities for every child.

The basic operational concepts are simple. The goal is for every child to be working at appropriate levels in every academic area. This goal demands initial and periodic assessment of the academic progress of every child to insure that he is working on materials which are relevant. Implementation involves complex scheduling for deployment of children to specific teachers working at various levels and rates in different academic areas. The "exceptional" children are divided into three groups according to their educational status:

> Group A is composed of children, who require a special curriculum for optimal development. These children spend most of their day with the special education resource teacher mastering a curriculum designed to aid them in acquiring basic skills necessary for everyday living. Specific therapeutic work in perceptual-motor development, visual-motor perception, and auditory discrimination is provided for those children who have severe deficits in these areas. The children in this group often are integrated with other children for art, physical education, music and other areas in which they can interact beneficially.
>
> Group B is composed of children who require some special help in particular areas (such as reading) but who can be integrated with the school population in various areas. The goal for children in this group is to increasedthe level of integration as they strengthen areas of deficit.
>
> Group C is composed of children who have mastered sufficient skills to become integrated fully into the regular program but who may require periodic support and supervision.

Generally, children progress through the groups until full integration is achieved on a gradual basis. Obviously, their rates of progress differ and some children never achieve full integration. However, the advantages of this type of arrangement over a self-contained special class are tremendous. This special class is available for those children who need special work, temporarily or permanently, and a procedure for reintegration is provided for those children whose problems are educationally remediable. Also "normal" children who are enrolled in the regular program can be scheduled for individual help.

Much of the success of such an arrangement is dependent upon the availability of ancillary personnel. A supportive staff consisting of a pediatrician, a school nurse, a physical therapist, a speech therapist, a clinical psychologist, a social worker and an educational consultant should be available on call to the resource room teacher. Ideally, perhaps monthly meetings to share information and to integrate therapy, should be arranged.

Although formal evaluation of the three programs based on these concepts is in progress and is currently incomplete, judgments by teachers, administrators and consultants on various aspects of the program generally have been positive. Early reports indicate high teacher morale and good behavior and "progress" by the students. Although the projects are not "experimental" in the varrow sense, they represent new attempts to apply philosophical tenets concerning the education of all children. As the projects continue, problems concerning scheduling and assessment undoubtably will arise. To meet and solve these admittedly difficult problems is more commendable that proceeding with unsatisfactory arrangements and techniques.

The Model Preschool and the Behavior Modification Model

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Experimental Education Unit of the Child Development and Mental Retardation Center

University of Washington

Behavior modification is the basic educational strategy in all of the classes for young handicapped children in the Model Preschool at the Experimental Education Unit of the Child Development and Mental Retardation Center, University of Washington. Children enrolled in these classes present handicapping conditions of almost every clinical type and etiologic origin. Curriculum content varies markedly from classroom to classroom in order to serve these children with such diversified developmental and educational requirements. But there is that common denominator, the behavior modification approach that provides the basic structure in the implementation of the various curricula. A first point which I should like to make, then, is that the principles and procedures which govern the behavior modification approach are independent of curriculum content. Any sound, theory-based preschool curriculum in use in any preschool setting with all types of children from the supernormal to the extremely atypical can be more effectively, creatively and humanely implemented by employing the techniques that characterize the behavior modification approach.

Actually, all teachers everywhere are engaged in behavior modification. Unless a child's behavior is modified, that is, changed, in a number of specifiable ways while he is in a school program, the program has failed to provide him with a sound, functional learning experience. This is true regardless of the

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Paper presented at the 50th Annual International Convention of the Council for Exceptional Children, Washington, D.C., March 23, 1972.

type of child or the type of program. Take a typical three year old embarking on his first group experience away from home. Initially, sometimes for a number of days, he may cling desperately to mother, refuse to interact with teachers, children or play materials, engage in disconsolate weeping or vociferous tantrumming every time mother tries to leave. There is never any doubt in the teachers' minds that they want to modify this entire repertoire of behaviors, change it in a number of ways; perhaps even modify some of mother's behavior in order to facilitate the child's adjustments; and they do, almost without fail, if they are truly good preschool teachers, well-trained in child development. Within a few weeks the child is bouncing about the play yard and school room, interacting comfortably with teachers and children, exploring and experimenting freely with materials and equipment. His behavior has been modified drastically. The teachers are pleased with the child and with themselves, even those teachers who are most opposed to behavior modification as an approach to preschool education. It is likely that they explain the change in the child to "growth in self-confidence," or "reduction in separation anxiety" or some other internal and untestable construct. Such constructs, of course, are gratuitous and unnecessary, for they are always derived from the overt responses which the child makes. My second point, then, in encapsulation: all teachers, regardless of their philophies, if they are effective and successful, are engaged, one way or another. in behavior modification.

If these two points indeed be the case--that the behavior modification approach is independent of curriculum content and that all effective teachers and programs everywhere are engaged in the modification of children's behavior what are the distinguishing features of our Behavior Modification Model Preschool Center for Handicapped Children at the EEU?

In a nutshell, the most distinguishing features are these:

1. We view the preschool classroom as an environment filled with stimuli that control the probability of altering, developing, and maintaining a variety of learned responses in the child.

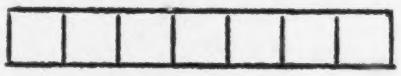
2. We insure this control by the systematic and contingent arrangement and presentation of the stimuli in the classroom--material, equipment, teacher attention, peer interaction, structuring.

3. We measure, directly and continuously, the rate of the child's progress in this environment, which, in turn, yields a measure of the effectiveness of this learning environment.(Elegant, would you not agree? Comprehensible? Probably not.) Let me see what I can do to translate this into common, every day classroom procedures as practiced by teachers in the Behavior Modification Model Preschool.

First of all, all teachers and related staff, be they aides, volunteers, college student trainees--anyone and everyone who steps foot inside the classroom to work with children--are taught to measure behavior, directly and precisely over time. Such measurement may take very simple forms: how many times does Sheila, an orthopedically handicapped child, pull herself to her feet during the 25 minute free play period indoors? How many and of what duration are Sherri's tantrums each day? How long does it take Mark to complete a complex matching task involving nine one-inch cubes? What is Karen's actual span of attention--that is, how many seconds or minutes does this overly active child actually spend with blocks, with easel painting, with puzzles, with hammer and saw, with preacademic tasks? Direct measurement of exactly what responses are actually made in the here and now provides the foundation and framework for the group as a whole, for individualized programs on each and every child, and for very specific teacher-training procedures.

All program objectives, all goals and subgoals, or target behaviors as they are commonly referred to, are determined for each child on the basis of direct measurement of that child's response capabilities when he enters the program. For example, in the programs which I supervise directly there are 126 data-based programs in progress on the 31 children enrolled. Two hundred ninety eight data-based programs have been completed since the start of school in late September. Almost all of these data are collected by the teachers or the inservice trainers. Psychometric tests are rarely if ever used as indicators of response capabilities. When a child is just enrolled we feel strongly that his entering behavior must be assessed directly, rather than inferred, if a teacher is to start "where the learner is." This initial procedure is known as "collecting baseline data" and once it has been determined where the child is in relation to the broad curriculum objectives, a sequence of learning activities or steps is tailored to that individual child.

Tailoring the learning activities to suit the individual child means that we must create or structure a favorable learning environment. One of the cardinal rules is to arrange situations so that correct responses can occur early in the learning sequence. Such planning reduces frustration, error and failure while insuring success. For example, the child who cannot wield scissors: you have all noted how frustrated these children become when they attempt to do the simple, yet for them, complex preschool cutting tasks that many of their peers do so readily. We would not even expose such a child

to that type of task in the beginning stages of learning. Instead we might take him for a few minutes each day to a spot away from the rest of the group, especially is he is a highly distractible child, and start him with a half-inch strip of paper marked at intervals with a heavily drawn line.  Then we would help him to hold the scissors, help him to insert the paper far back between the scissor blades so that one crunch allows him to have a successful experience immediately that the teacher can praise warmly and sincerely. Gradually we increase the width of the paper, gradually we change the shape of the lines, gradually we fade the intensity of the lines. And the means for continuous data-taking are right there in the snipped-off pieces. These can be counted right then and there, with the child (another good learning experience) and recorded, day after day, at little cost in teacher time.
In the beginning, task time is kept very short and the number of successful responses required minimal. The child is then free to go to a play activity of his choice.

The foregoing example, simple as it was, exemplified almost all of the major tenets of the behavior modification approach to preschool education. Let me take this scissor-cutting example apart and focus one-by-one on each aspect.

First of all, baseline data were collected. That is, our teacher observed and recorded that this child had no scissor-holding nor scissor-cutting skills. She recorded, too, that his span of attention was very short--a range of 10 to 47 seconds for table work and that his attention was frequently distracted by the activities of the other children at the table. At this point, the one thing that the teacher does not do is to label him as hyperactive, immature, not ready, or whatever else is the current favorite. Hang a label such as that on a child at the preschool level and it very often accompanies him throughout the primary grades influencing the way teachers respond to him and thus perpetuating his problems.

Instead, on the basis of the baseline data, the teacher embarked on the second major step--that of creating or structuring a favorable learning situation. This second step involved a number of component steps:

1. Finding a few moments to work with the child alone, each day, in a semi-isolated spot in order to eliminate all of the responses that he made in a peer-group situation, that were incompatible with, that is, interfered with, scissor-cutting responses.

2. Arranging the learning materials and feedback procedures to insure learning. In other words, careful and systematic programming, a key concept in the behavior modification approach. This is a three-fold procedure where materials are arranged in a graduated sequence that prompts active and continuous responding from the child; where immediate confirmation lies within the material itself, and is available to the child to let him know whether or not his response is correct; and where the child may proceed through the program at his own pace thus avoiding the frustrations of being pushed or held back.

The third major principle implicit in the scissor-cutting example was the use of positive reinforcement contingent upon the child's appropriate responses. For most young children the preschool environment abounds with positive reinforcers: teacher attention, play with other children, use of play materials, outdoor activities, and a number of other reinforcing stimuli.

For the occasional child who is not responsive to these reinforcers inherent in the school environment, more contrived reinforcers such as tokens or food may have to be paired temporarily with the more naturalistic reinforcers until they acquire reinforcing properties for the child. Put another way, for a child who is not responsive to teacher attention, the teacher initially may have to pair attention to the child with bits and bites of one of the child's favorite foods. In the process, the teacher's attention acquires reinforcing properties and the contrived reinforcer can be eliminated, usually within a very short time.

In the case of the scissor-cutting example, such contrivance was not necessary, for the child was highly motivated by adult social reinforcement contingent upon a correct cutting response and by the opportunity to select a play activity of his own choice contingent upon completion of the task (Premack, 1959). Of course, the end goal for every child is that the child be reinforced by his own success. Evans (1971) puts it this way "...the most desirable, effective reinforcer for humans is success, that is performing [well] and knowing that one has performed [well]. For success to be a reinforcer, however, conditions must be very precisely arranged; ..... children frequently need to develop subsidiary behaviors before meaningful success can be achieved."

It is in this area of extrinsic versus intrinsic reinforcement that much of the heat about behavior modification procedures have been generated, especially by its adversaries. Traditionally, intrinsic motivation has been thought of as "learning for learning's sake" or "learning for the love of learning" and that programming extrinsic reinforcers is tantamount to bribing the child. Feared, too, is that the child becomes dependent upon such incentives for learning. However, there is a vast difference between promising a child an ice cream cone if he is a good boy at grandma's and structuring a situation that results in responses being made which can then be reinforced--arranging the time of the visit so that the child is not at a peak level of fatigue, providing him with play materials of his own so that he will not scatter grandma's knick-knacks about, engaging in some activities with him so that he does not feel that he is completely lost in that vast garble of incessant adult talk, taking him home before he falls apart, etc. I know of no evidence which supports either the bribery or the dependency aspects of reinforcement provided the behavior modification program is carefully and systematically worked out. Such a program, in fact, usually leads the child to be more sensitive and responsive to natural reinforcement, for the point is that consequences do follow every response a child makes whether it's reaching in the cookie jar, beknownst or unbenownst to mother, or inadvertently tearing the figure that he was supposed to be cutting around. Systematic application of behavior modification principles to preschool education make the consequences positive instead of negative, effective rather than non-effective.

A further argument along these lines is that it is such a cold and non-nurturing approach. Nothing could be farther from actuality if one carefully observes a well-run behavior modification classroom where the teachers are thoroughly trained in child development and have formulated developmentally sound objectives for their children. To equate systematic teaching with an emotional vacuum is an outright fallacy and any teacher who responds to children in a cold, non-nurturing fashion is probably that way by disposition and not by behavior modification training. It is likely that that kind of person would come on as emotionally antiseptic regardless of the approach to early education, be it traditional, cognitive, Montessori, or whatever.

Now, after this long, but in my estimation, necessary digression, let us get back to the scissors-cutting example and the fourth principle to be explicated--that of behavior shaping or reinforcing successive approximations to end goal or target behavior, in this case, moving the child to the point where he can, all by himself, stick to and accomplish fairly complex cutting tasks. Each of the successively more complex strips of paper is a successive approximation to this goal and the reinforcement stretegy is this: once a new approximation has been acquired the lesser approximation is no longer reinforced. This principle holds for any and all learnings that are seen as appropriate and desirable in the preschool curriculum, be they physical in nature, e.g., getting a child to run and jump and climb more freely and confidently; helping him to acquire socially acceptable ways of interacting with his peers; promoting functional language; increasing span of attention; whatever the program objectives or teacher goals may be. The reinforcement of successive approximations is the most sure and efficient and benign way of moving the child forward successfully and self-confidently.

This brief inventory of four basic procedures: 1) engaging in direct and precise and continual measurement of responses; 2) structuring a favorable learning environment; 3) selecting extrinsic reinforcers that will motivate and sustain the child until success itself takes over as the reinforcer, and 4) shaping, or reinforcing successive approximations to the end goal by no means explore all of the fine nuances of our exemplary behavior modification Model Preschool program. Many of these nuances will come to light as Mrs. Rieke and Mrs. Dmitriev talk about their particular programs within the Model Preschool at the EEU. The four basic procedures do reflect, however, the underlying structure of our Model Preschool where every child, regardless of his degree of "normalcy" or "deviancy" is regarded, in the main, as a product of the environment which purports to teach him. If a child has a learning problem it is viewed as an outgrowth of faulty structuring in the learning environment and not as some inherent pathology within the child. When practiced as we practice it, this implies a most constructive attitude and positive departure from the all-too-frequent tendency of teachers to view children's problems as personal weaknesses or deficiencies or to foist the blame off onto parents, shrugging off teacher-responsibility with the oft-repeated phrase, "What can you expect of a child who comes out of a home situation like that?"

By way of closing, then, I might attempt to articulate our credo which is essentially this: if a child, regardless of his handicapping condition is not learning, it is we, as teachers who have failed--not the child. We have failed the child and it is up to us to examine our data and our procedures, ferret out the flaw, and change our program in specifiable ways. If a teacher is systematic enough, ingenious enough, humanly caring enough, every child can and will learn.

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Premack, David. Toward empirical behavior laws: I. positive reinforcement. Psychological Review, 1959, 66, 219-233.

COMPETENCY BASED EDUCATION

Paul W. Cates, Ph.D.
Director, Psycho-educational Clinic
Graduate Professor, DePaul University

We are now moving way into the 1970's. In the last decade, we now can do heart transplants, kidney transplants, and now let's project ahead five or six years and visualize that we can do brain transplants.

You are sitting in the doctor's office discussing the brain that you would like, and of course you are nervous wondering how much his charges for such an operation will be. He explains it will depend on what kind of brain you would like: if you would like a teacher's brain, it will cost you $100 an ounce; if you would like a principal's brain, it will be $300 an ounce; and if you would like an administrator's brain, it will be $1,000.

You look puzzled. You don't understand the great difference in prices. That's over $900 difference, you explain. Yes, the doctor agrees, but do you realize how many administrators have to walk into my office before I gather one ounce of brain?

Competency Based Education. Let's start with a child's Bill of Rights:

Let me grow as I be
And try to understand why I want to grow like me
Not like my Mom wants me to be,
Nor my Dad hopes I'll be.
Please try to understand and help me grow
Just like me!

Gladys Andrews

POOR SCHOLAR'S SOLILOQUY

No, I'm not very good in school. This is my second year in the seventh grade and I'm bigger and taller than the other kids. They like me all right, though, even if I don't say much in the school room, because outside I can tell them how to do lots of things. They tag me around and that sort of makes up for what goes on in school.

I don't know why the teachers don't like me. They never have very much. Seems like they don't think you know anything unless they can name the book it comes out of. I've got a lot of books in my own room at home--books like Popular Science, Mechanical Encyclopedia, and the Sears' and Ward's catalogues, but I don't very often just sit down and read them through like they make us do in school. I use my books when I want to find something out, like whenever Mom buys anything secondhand I look it up in Sears' or War's first and tell her if she's getting stung or not. I can use the index in a hurry to find the things I want.

In school, though, we've got to learn whatever is in the book and I just can't memorize the stuff. Last year I stayed after school every night for two weeks trying to learn the names of the Presidents. Of course I know some of them like Washington and Jefferson and Lincoln, but there must have been thirty altogether and I never did get them straight.

I'm not too sorry though because the kids who learned the Presidents had to turn right around and learn all the Vice Presidents. I am taking the seventh grade over but our teacher this year isn't so much interested in the names of the Presidents. She has us trying to learn the names of all the great American inventors.

Kids Seemed Interested

I gues I just can't remember names in history. Anyway this year I've been trying to learn about trucks because my uncle owns three and he says I can drive one when I'm sixteen. I already know the horsepower and number of forward and backward speeds of twenty-six American trucks, some of them Diesels, and I can spot each make a long way off. It's funny how that Diesel works. I started to tell my teacher about it last Wednesday in science class when the pump we were using to make a vacuum in a bell jar got hot, but she said she didn't see what a Diesel engine had to do with our experiment on air pressure so I just kept still. The kids seemed interested though. I took four of them around to my uncle's garage after school and we saw the mechanic, Gus, tearing a big truck Diesel down. Boy, does he know his stuff!

I'm not very good in geography either. They call it economic geography this year. We've been studying the imports and exports of Chile all week but I couldn't tell you what they are. Maybe the reason is I had to miss school yesterday because my uncle took me and his big trailer truck down state about 200 miles and we brought almost ten tons of stock to the Chicago market.

He told me where we were going and I had to figure out the highways to take and also the mileage. He didn't do anything but drive and turn where I told him to. Was that fun! I sat with a map in my lap and told him to turn south or southeast or some other direction. We made seven stops and drove over 500 miles around trip. I'm figuring now what his oil cost and also the wear and tear on the truck -- he calls it depreciation -- so we'll know how much we made.

I even write out all the bills and send letters to the farmers about what their pigs and beef cattle brought at the stockyards. I only made three mistakes in 17 letters last time, my aunt said -- all commas. She's been through high school and reads them over. I wish I could write school themes that way. The last one I had to write was on, "What a Daffodil Thinks of Spring." and I just couldn't get going.

I don't do very well in school in arithmetic either. Seems I just can't keep my mind on the problems. We had one the other day like this:

> If a 57 foot telephone pole falls across a cement highway so that 17 3/6 feet extend from one side and 14 9/17 feet from the other how wide is the highway?

That seemed to me like an awfully silly way to get the width of a highway. I didn't even try to answer it because it didn't say whether the pole had fallen straight across or not.

Not Getting Any Younger

Even in shop I don't get very good grades. All of us kids made a broom holder and a bookend this term and mine were sloppy. I just couldn't get interested. Mom doesn't use a broom anymore with her new vacuum cleaner and all our books are in a bookcase with glass doors in the parlor. Anyway, I wanted to make an end gate for my uncle's trailer but the shop teacher said that meant using metal and wood both and I'd have to learn how to work with wood first. I didn't see why but I kept still and made a tie rack at school and the tail gate after school at my uncle's garage. He said I saved him $10.

Civics is hard for me, too. I've been staying after school trying to learn the "Articles of Confederation" for almost a week because the teacher said we couldn't be good citizens unless we did. I really tried, because I want to be a good citizen. I did hate tostay after school, though, because a bunch of us boys from the south end of town have been cleaning up the old lot across from the Methodist home. I made the jungle gym from old pipe and the guys made me Grand Mogul to keep the playground going. We raised enough' money collecting scap this month to build a wire fence clear around the lot.

Dad says I can quit school when I'm fifteen and I'm sort of anxious to because there are a lot of things I want to learn how to do and as my uncle says, I'm not getting any younger.

Competency Based Education. This is a workshop for the development of objectives, to form a Competency Based Curriculum involving parents, administrators, and experienced teachers in writing objectives to meet the needs of individualized instruction and to afford "equal" education for the children they work with.

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In the past, there have been several programs that were initially established and funded by Washington based on the Competency Based Education approach. These programs were at the following places:

Florida State University
University of Georgia
University of Massachusetts

Michigan State University
Northwest Regional Education Laboratory
University of Oregon
University of Pittsburgh
Syracuse University
Teachers College, Columbia University
University of Toledo
University of Wisconsin

What do we mean by Competency Based Education? We mean that the education offered to any student at any level will be individually based. By this is meant that degrees will be awarded to students who demonstrate various competencies -- that is, skills, understandings and attitudes as they relate to individual programs of study. Degrees will not be granted to students simply as a reward for progressing over sequential curricular goals. Education will enter into a contract with each of the students. The contract will define precisely what education and the student together must do in order for the student to obtain the skills, understandings, and attitudes that both deem necessary.

Each student in this type of educational setting must be the major partner in designing his own education. During the 1970's our students are called upon to perform higher duties in peace and in war than ever have been required of students of their age. Therefore, they are capable of contributing also to the design of their own education, atleast by the time they enter our secondary program, probably even much before that time.

We do recognize two factors that (1) very little in the student's encounter with educational institutions in the past decade has prepared him for accepting responsibility for designing his own education. Previous educational experience will likely have taught him that it is someone else's responsibility to tell him what he must do to be "educated". Education, therefore, must teach many (probably most) students how to design their own education. An education and an educational system should exist to provide each student with an intimate and meaningful contact with those who know more than he knows about education.

For this reason, faculties must not simply accept as valid any and all educational goals and methods posed by any and all potential students and any and all potential methods given to it in the past or in the future, be it traditional, progressive or any other such labeled system. Educators must analyze student educational goals and methods, pointing out in them what is inconsistent, meaningless or contrary to the student's own interests or society's best interests.

In Competency Based Education, there is a triangular relationship entered into with each individual student. We are not just discussing a concept built upon a shack that is already crumbling. We are not discussing the re-training of the "bluebirds, canaries, and vultures." We are talking about a system designed to meet the individual needs of the individual student. This triangle has three points and all three points are equally involved in the process of education.

The first point of that triangle is the community, on which we will elaborate momentarily. The second point of the triangle is the university. Again we will expound on that shortly. The third point of the triangle is the local educational agency.

All of the points of the triangle determine the education that should be offered in conjunction withthe needs, goals, objectives and priorities of the individuals that take part in that system. The system should be asked to be evaluated on one criterion only, and that is to be judged on the standard of what their students accomplish; what they set out to accomplish and also what they have been able to accomplish in conjunction with their ability to adapt to the system of which they are a part in their society, particularly their accomplishments as citizens.

> We have learned some things about the educational process. One is that experience outside the classroom can actually benefit classroom performance and make it more meaningful .... A second is that it may be hazardous to have a student too separated from the realities of the world at work, too immune to the practicalities of actual accomplishments, too

> removed from contact with their fellows...
>
> Less Time, More Options. "The Carnegie Commission Report" pp 9-10.

It is for these reasons that Competency Based Education will structure into each segment of its program both the opportunity and the necessity for integrating the work-life with the educational-life of its students. These experiences may come in many forms. They may come at the elementary level in terms of a community project. They may come, at the intermediate or later grade level, in terms of work-study. They may come, at the university level, it terms of an internship or a person's present employment or any other designation at any time. Whatever the form or setting, it will remain that no one will graduate simply by going to classes or following syllabi -- not because these are evil but because they are inadequate. If education is life-long then a profession must be perceived as an opportunity to learn and to teach. Man's total environment is his classroom and his life should be his curriculum.

These meaningful experiences or projects should be closely related to the student's career goal or at least should be located within the student's broad field of interest. These experiences should not be merely exposure to practical pursuits but should provide practical pursuits that will provide the context and stimulus for growth and development of all individuals through the use of analysis, reflection, further study and inquiry, and the higher processes as mentioned in Bloom's Taxonomy.

> The modern academic system has, like a magnet, drawn all institutions toward its organizational form, until today the same teaching method, the same organization by disciplines, and the same professional academic training for faculty are nearly universal.
>
> Newman Report, p. ix

We believe that there is a need for new approaches to education, not only new types of systems with new missions, but also new patterns of obtaining one's education.

As the Carnegie Report again points out on page seven:

> Some (students), perhaps as many as 1 in 6, are unwilling "captives" of formal higher education, attending against their will becuase of the pressures of their parents and the expected requirements of the jobs to which they aspire. Many others attend school more steadily and for longer periods or in programs that do not match their interests than either they wish or society requires.
>
> Carnegie Report, p. 7

Education should serve the economically poor. It should serve them not simply by making the education affordable -- many institutions attempt to do this. It should make it available in a form and in an environment that the poor do not find hostile.

It is generally recognized by most that education is a middle-class institution in which the poor -- both the working and the unemployed poor -- are neither comfortable nor successful. This failure has nothing to do with intellectual capacity. It has much to do with the lack of awareness of the needs of students outside the mainstream of higher education.

We recognize that the validation of non-academic or extra-institutional experience for purposes of education is a sensitive and difficult task. It is a sensitive issue because it seems to imply that one can become educated without attending school and, therefore, schools may be unnecessary -- atleast for some persons, at some time, in some situations. Those of us associated with education at any level -- being all too human -- tend to resent any suggestion that our systems and processes to which we devote our lives are unnecessary to anyone. (Explicitly we deprecate our contribution; implicitly we exaggerate it.)

Without regard for these sentivities that are involved there is a problem of determining if an individual has obtained the equivalent of a particular level of education. How does one measure equivalency? Who measures it? With what instruments do we measure? All of these problems need to be met on a local and individual basis with committees that are involved in Competency Based Education.

In any educational environment students should be learning resources for one another. An educational system which actively recruits students from all ages, all social strata, both sexes, all occupations and professions, all ethnic and racial groups, will definitely be a notably better place to learn than an institution with a homogeneous student population. We do not assume, however, that students will automatically take advantage of the opportunity to learn from one another. We expect that there will be a drift among students who are atleast superficially similar. For this reason, competency based programs are planning to utilize a number of techniques to ensure students useful encounters of widely varying backgrounds, interests, goals, and abilities. A major purpose in setting up a competency based program is to test a variety of techniques relative to enhancing such student interchanges and to build upon these student interchanges.

Competency Based Education needs to utilize the community of which it is a part. It needs to utilize the libraries, museums, churches, schools, studios, homes, parks, shops, factories, banks, and even the streets of its urban cities. Competency Based Curriculum should not become a cloister. It's campus should be wherever there are people and the possibility of an environment conducive to learning. In most of our communities such facilities presently do exist and are, for the most part, totally under-utilized. By using existing resources within the educational framework of the community at large, new resources, new areas, new opportunities are afforded our students at all levels.

This approach has numerous advantages, not the least of which is that it will teach the student how to utilize their cities rather than become dependent upon specialized facilities created by education for the exclusive use of students. It will eliminate expensive duplication of efforts in all our large metropolitan areas. Since our students are citizens, they are entitled to use our public facilities without cost and should learn how to use them at greater length. With this approach states need not build expensive additional facilities to house every new whim of education.

Let's take libraries for example. Education should utilize public libraries scattered throughout their urban areas, as well as private libraries, all of which can be made available at minimum cost. In this way education can become a useful community catalyst which will enhance the already existing efforts of inner-city library corporations and cooperations. This will also make the students sophisticated clients -- men and women who will maximize the utilization of these too-often neglected educational resources. Instead of teaching students to be dependent upon school libraries designed exclusively for their use, whether it be elementary, secondary or university level, education will also teach students how to interact fruitfully with the existing libraries thereby making the students more effective citizens and perhaps contributing to an increased responsiveness on the use and need of these public resources. If it should prove necessary, then education would seek additional funds to aid these already existing libraries so that they could attain their needs with additional supplementary assistance to meet the students' needs instead of complementary assistance.

For classrooms education based on a competency based approach would utilize space in already existing facilities such as arts and science centers, the civic center, state capitol complexes, public and parochial schools, churches, junior colleges, private colleges, local businesses and private facilities. In addition, education should utilize the excellent laboratories and specialized facilities of any and all private industries and government agencies that want to and will cooperate with the educational system.

Education tends to teach students to be dependent upon the institutions instead of teaching them how to function as effective members of the community as a whole. When students leave the educational system they are often mental and emotional cripples, unable to relate to the real world around them. In part this may account the excessively long time some students take to finish their formal education and their inability to break away from the institution even after their education is completed.

The goal of Competency Based Education is to create an education which teaches students how to make their education work -- not only how to make the system work. Urban life, at its best, when understood, can be the most civilized life for man, but at its worst, urban life is debilitating and destructive to man. Most of our students, 80%, are growing up in an urban environment -- a factor in the breakdown of American cities as well as the isolation of education from the cities and the failure of education to teach students how to function in the cities. In part this failure may be a result of the fact that faculties and facilities have isolated themselves from the cities, too remote from the day-to-day problems of those who must make the cities function. The function of education is not to create an educational community, but to support the education of a total community where all citizens can live and establish a good life.

In the 70's education should come to involve all of its constituents -- students, faculty, alumni, our wonderful public at-large, and anyone else involved within the governs of the state. Education should be abandoning the notion that governance is the exclusive province of the governing boards and the presidents in favor of a view of themselves as a public institution serving the needs of all of their individual clients. On the other hand, to function as complex a society as education is today in an extremely complex social environment, educational institutions are going to require continuity and planning; they are going to have to secure resources necessary to support that enterprise; they are going to have to have continuity and to have this there must be people to devote full-time to the performance of functions to see that this goal is achieved.

An administrator of this system must be a teacher of today in order to assist all those who make the system work. It is not enough merely to be open to decision-making but an administrator must be involved and to involve all those that are affected by decision of that system. Decision-making must be made by students, faculty, support staff, board members, and members of the community at-large. Therefore, to be an administrator in this system, one must have not only the information readily available, but must also be able to steer alternative courses of action, stimulate decisions, and make decisions that will be properly implemented and respected by all parts of the triangle.

Again, a good administrator is a democratic teacher, not a behind-the-scenes manipulator of people. More often than not, he does not know all the answers. He does know some of the right questions and how to seek some of the answers, and the posing of questions and the leading of searching for answers, which he should try to accomplish within the triangle. Each student is the same as a colleague in finding and implementing the answers as they emerge, as they all work together. Of course, he is fully prepared to learn from other good teachers also.

To lead implies that one has a sense of direction. One of life's great tragedies is the individual caught up in the pursuit of his own system. An administrator must have confidence in his own vision of education's destiny, yet he must be sufficiently modest to recognize that his vision must take its place with that of others within the institution and the institutional market-place of ideas within any community.

All of these people must submit their ideas for review -- being an important part of the triangle, not most important, but all equally important parts of the triangle. All parts of the triangle must realize that eventually someone must serve in helping with the direction that the system wishes to go. As a system we move together -- together. Someone needs a clear understanding of what that system, as designed, wants; but as individuals and students move through that system, these efforts must be made within the triangle, working together with the individual as the clear focus. Not just to change the bluebirds, canaries, and vultures, but the PERT individual programs for individual students with individual needs.

It is not the case that existing patterns of education are wrong -- rather it is simply that they are not right for everyone. Existing patterns must be maintained and supported but at the same time new patterns must be established to reach the needs of those currently outside of the mainstream.

It has been said that, the way education is going, by 1973 one out of two of our students in American public education in the urban cities can be labelled "culturally deprived". What we question here is not the label but is education and colleges meeting the needs of their students to serve in the decade of the 70's.

Education's offerings are limited only by the resources of the community and the ability of the people in that community to assist its students in utilizing its own material resources within its own environment.

It is our commitment that all individual student should proceed at his own pace, moving rapidly, moving slowly, moving appropriately for each individual student. The concern of Competency Based Education is one of excellence. Our students must be afforded the highest quality of education we can provide in this environment. It must be a system in which the student is the architect of his own education. He must be directed to his own needs and his own goals under proper supervision. He will be assessed on the basis of competencies acquired and not on the basis of course taken, to help all students of this education achieve these goals.

At this point we broke up into groups of 15 to 20 individuals and spent the day going through the setting up of a Competency Based Curriculum. Seven steps were involved and evaluated:

Step 1 Idea Generation.

It is an activity to generate ideas related to the context, as a basis for attacking the situation and developing an effective Competency Based Curriculum activity.

Step 2 Idea Organization

The purpose of this step was to develop an organization of the ideas that were generated in the first step so that the project could be formed with the community, the university and the local educational agency working together.

Step 3 Idea Selection

Ideas were brought out and selected as a basis of a program.

Step 4 The Total Plan

This step provided the members with an opportunity to conceptualize the total project plan which they had planned and evolved from the organization of ideas.

Step 5 Task Planning and Organization

In this step the individuals looks closely at the organization of one task and determined the concerns related to task planning and organization.

Step 6 Task Management Plan

In this plan the individuals developed a task outlined in an earlier step. They outlined the the information used to establish the task, monitor its operation, adjust activities, select alternatives based on operational failures or weaknesses, and make changes because of new inputs.

Step 7 Overall Management PLan

They developed an overall management plan as a guide for program development and operations in a Competency Based Program.

50th Annual Convention
Council for Exceptional Children

Workshop Presentation:
A Competency Based Workshop in Arithmetical Programming

Participant Presentation:

Usefulness of Curriculum Materials

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Usefulness of Curriculum Materials

Two of the problems that the project[1] has to face in developing instructional materials are first, when we train undergraduate or graduate students to be special educators, we train them to rely on diagnostic and perscriptive techniques in teaching and to provide their students with a competency based curriculum. However, when these new teachers reach the schools, they often find that the materials they might need to make their training useful are just not available. As a recourse to this predicament the teachers are encouraged to be creative which means to sit home every night and cut and paste in order to prepare for the next day. This is often beyond the scope of what most teachers can do. A second problem has to do with the amount of material already available. In a paper, Dr. Cawley has compiled an admittedly incomplete but reasonable list of purposes underlying the utilization of instructional materials. Among the items on the list were:

1. To help children perform more adequately.
2. To provide teachers with an efficient system of continuous diagnosis along with instructional options related to said diagnosis.
3. To provide alternate strategies trough which

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[1] This paper was prepared pursuant with a grant from the Bureau of Education for the Handicapped, USOE, "A Program Project Research and Demonstration Effort in Arithmetic Among the Mentally Handicapped" OEG-0-70-2250 (607) #162008, under the direction of J.F.Cawley, Project Director, University of Connecticut, Storrs, Connecticut.

children can positively demonstrate their developmental attributes.

In order to accomplish the above objectives, curriculum material developers have created a phenomenal array of divergent forms of instructional materials. What has happened, especially in mathematics curriculum,was that each time a new or old problem was encountered which was concerned with teaching a specific concept or set of facts, a new set of materials were created and published. A competent teacher who has to face this extensive array of materials would find it impossible to conduct a search that would lead to the identification of those materials which would be most valid for her particular purposes and if she did, it may be impossible to afford them once they have been identified.

Since the Math Project is working on a relatively untouched area - arithmetic programming for handicapped children - it was decided to give the matter of instructional materials development the most serious of considerations. With the two problems mentioned above and others in mind, we decided to follow the proposition which suggested that equivalent benefits could derive from the use of a small set of instructional modes that could be utilized in a variety of specified instructional activities. This contrasts with the approach that requires new materials for each instructional activity.

In order to demonstrate what we mean by the proposition given above, we will interact with a single set of materials from which we will extrapolate a variety of instructional activities. There are three (3) sets of materials currently identified with the project and one of these is The Picture Extrapolation Kit (PEK). The materials we have here (see Figure I) are one example of this kit which consists of sets of three cards, each 9 3/4" x 13". Each set of cards contains pictures of an easily identifiable object. In the example we have there are flowers in vases. Each card contains a given number of 2" x 2" squares on which smaller cards or objects can be placed. The fact that the cardinal property of each card is limited stresses the point that with the continual reuse of the materials principles are being developed instead of computation.

To restate the original proposition in terms of this example of the PEK, we might say that with this given set of three cards and a variety of smaller cards or objects, we can provide the learner with activities that will teach him a very wide range of concepts and ideas in mathematics. Of course we would qualify this statement by saying that we wouldn't suggest using just one set of materials and also that certain areas of mathematics would be inaccessible. For example, it would be difficult to teach measurement and geometry. However, using one, two or three of the cards found in any given set, one can teach many of the concepts found in most of the other strands in arithmatic.

What we will do now is to go through a series of activities which can all be taught with the materials found here (Figure I). We will begin with examples of what might be taught to a child with no concept of number and carry through to the stage of teaching some number operations.

One area that we would begin teaching a child with no concept of number is classifying. Classifying is important because it begins to give the child the notion that he can generalize a property across groups of objects and identify a property within groups. Rational understanding of number is based on the ability to assign a property across groups where those groups have that property in common.

There are several dimensions within which we can ask the child to classify. These might include color, shape, size, label or category. We could ask the child to point to the red flowers as apposed to the green ones, the big flowers as apposed to the small ones, or the long thin flowers as apposed to the short round ones. In classifying, one, two or three of the cards can be used and we can have the child either recognize, construct or describe verbally the sets specified by our classifying scheme.

Classifying is similar to set identification. Once the child has learned to identify sets, he can begin to work on set equivalence through one-to-one correspondence. This would require two cards. Here, we might ask the child to make sure he has a flower in his vase for each flower the teacher has in hers.

Patterns would also appear as an initial pre-number concept. Patterns are a very important concept because our entire number system is based on the notion of a pattern, that is units which repeat themselves. Patterns would be taught utilizing the same dimensions we used in classifying. For instance, on the basis of color, we might ask the child to place his flowers in his vase in the same order as the teacher; first a green one, then a blue one, et cetera.

The child can be asked to reproduce, recognize or extend a pattern as well as perform a reverse shift, interdimensional shift and extradimensional shift.

As a preliminary to number operations we can teach the child some operations on sets such as union and intersection. In union, we would ask the child to point to the vase(s) that had blue flowers or yellow flowers in it (them). In this case our dimension is color. For intersection, we would ask the child to point to the vase(s) that had blue flowers and yellow flowers in it (them), thus this being a more exclusive operation.

When we begin to teach the child counting we would prefer to teach a rational understanding of number rather than rote naming of numbers in a series. We would teach the child the cardinal property of a set as we taught other properties of a set in classifying. We would ask the child to say two when he saw two flowers in the vase, three when he saw three and so on.

Many Piagetian tasks can also be developed with these materials. Conservation of number can be accomplished by first specifying the equivalence between two sets of flowers, then spreading one set of flowers out and asking if the two sets still have the same amount. The class inclusion question can be asked by requiring the child to state, for instance, whether there are more flowers or more roses in the vase when there are both roses and daisies present.

When we do finally come to the point where we would begin teaching adding, we might want to first use just one vase. The child first places two flowers in the vase, then three flowers in the vase and acquires his sum by counting how many there are in all in the vase. Later two and three cards can be used to make more complicated problems.

Now that we have seen that the materials can be used for a variety of activities, it should be easy to imagine how they can also be used for many concepts that I have not mentioned such as subtracting, multiplying and dividing. It should also be pointed out that the materials serve the function of individualizing instruction to the extent that the teacher can use the same materials to ask different questions to children operating at different levels though, all being taught to at the same time. This function is necessary if the three purposes presented at the beginning of this paper are to be attained.

In summary, it is appropriate to say that it is possible to develop an approach to the construction of instructional materials in which more extensive use can be made of the same sets of materials. However, this requires some attention to the development of a total program within which such a strategy can operate.*

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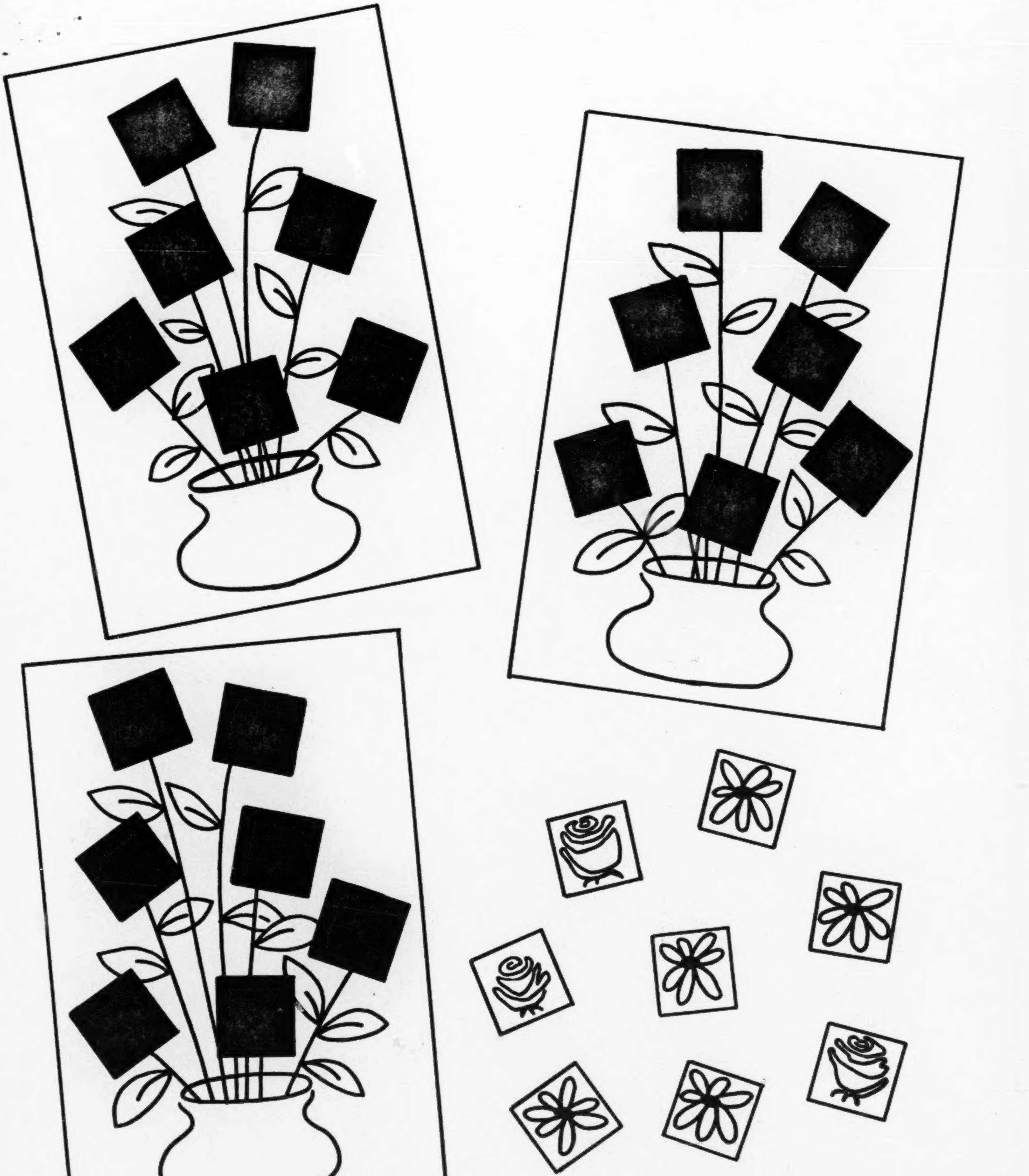
*Many of the ideas concerning the teaching of mathematical concepts are those solely of the author's and not of the Math Project per se.



ACTUAL CARD SIZES 9¾" X 13" AND 2"

FIG. 1. PICTURE EXTRAPOLATION KIT (PEK)

CEC Convention Presentation

An Alternative to the Special Services Model for Mildly Handicapped Children

The In-Service Experience Plan: An Overview - Stan Shaw

As educators become increasingly aware of the learning needs of children, the range of individual learning differences within the regular classroom becomes more apparent. We've made progress in dealing with individual learning needs through changes in school organization and curricula, the development of a more advanced teaching technology, and provision for more adequate pre-school education. Education is experiencing a revolution, and yet, eight million elementary and secondary school children in America today will not learn to read adequately. One child in seven is limited in his ability to acquire essential reading skills. The Report of the National Advisory Committee on Dyslexia and Related Reading Disorders stated that "this difficulty is of sufficient severity to impair seriously the overall learning experience of these students and their ultimate usefulness and adaptability to a modern society." A recent report of the Western Interstate Commission for Higher Education stated that of the more than one million children in the west who need special education services, 625,000 receive no help with their learning difficulties. It has been estimated that between 40 and 80% of handicapped children are not receiving adequate special education services. There can be no doubt that mildly handicapped children -- those experiencing significant learning difficulty -- are currently enrolled in regular elementary classes.

How does this information affect the goals of special educators? Specifically, what are the alternatives by which educators may serve those children who are experiencing learning difficulty and whose needs are not now being served? Which of several alternatives has the highest probability of minimizing, indeed -- preventing, the high incidence of learning failure among children experiencing learning problems? The current alternatives -- including special class settings, remedial services, resource facilities, diagnostic-prescriptive services or a combination of any of these -- share two operational characteristics which make it improbable that they could prevent learning failure. Each of these programs removes the mildly handicapped child from the regular classroom for all or part of the school day, thus encouraging the classroom teacher to relinquish direct responsibility for the child's learning in a particular area and to become dependent on the personnel providing special services. In addition, the major objective of each of these programs is direct service to the child. This emphasis does not encourage change in the teaching behaviors of the classroom teacher; again, it fosters dependence on special services personnel. There is significant evidence that these alternatives have not helped children with learning difficulty. In a review of the literature, Bateman indicated that correction strategies to remedy specific learning problems do not follow the medical "restoration to normalcy" model but rather require a "continued support" model. An excellent example of this problem is the Temple University Resource Room Project reported in the October 1971 issue of Exceptional Children. Those participating did an outstanding job of improving the performance of children in the resource room but found that the improvement did not generalize into the regular classroom. The study concluded that it is probably impossible for the classroom teacher to perform more effectively "unless specific techniques can be developed, communicated and implemented."

It is imperative that special and general educators now find means to effectively teach the mildly handicapped child in the regular classroom setting and with the classroom teacher directly responsible for each child's instructional program. A strategy that prevents learning difficulty and corrects previous problems in the regular classroom is needed. The alternatives discussed earlier assume that the classroom teacher cannot adequately meet the basic educational demands of every child in the classroom. By providing supportive services to children, special educators have accepted this assumption. Perhaps of more importance, special educators have encouraged the classroom teacher to depend on such supporting services. A longitudinal study on almost 1000 children by Rubin and Balow demonstrated that this dependence is a reality. Testing prior to school entrance indicated that the sample was essentially a normal population. Follow-up evaluations done one to four years later found that 24% had already been retained, placed in a special class or received special services. These children had school difficulties of sufficient severity to warrant not only identification but alternative action, even though 25% were completing kindergarten for the first time and were therefore ineligible for retention or special class placement. Although there is current evidence that the classroom teacher may not meet the basic educational demands of every child, there is no evidence that he cannot become self-sufficient in teaching the basic skills. Let's consider another possibility, a strategy which enables the classroom teacher to become relatively self-sufficient: competent to teach and direct all children in his charge, in the basic skills areas (that is -- reading, language and math) -- self-sufficient in teaching even those with significant learning problems -- the mildly handicapped. In addition this strategy should enable the classroom teacher to become skilled in behavior management - as competence in this area is needed for successful teaching.

As stated, the fundamental objective of the new strategy is teacher self-sufficiency. Therefore, any type of child-centered supporting service (instructional or behavioral) in the basic academic skills must be excluded, as well as any teacher-centered supporting service which is not consistent with the objective of self-sufficiency. Another strategy consideration naturally emerges: If teachers, when deprived of such supporting services, are not meeting the basic skills needs of pupils, tactics must be developed to enable them to do so. Such a series of tactics is outlined here and may be described as an in-service experience plan. Unlike remedial, resource or diagnostic-prescriptive services which are child-centered, this plan is teacher-centered, focusing on those aspects of the teacher's classroom program which he perceives as inadequate. In contrast to a diagnostic-prescriptive service which develops an individualized instructional plan for the student which is transmitted to the classroom teacher for implementation, the inservice experience plan enables the classroom teacher to experience the diagnostic-prescriptive process, and to learn and transfer the skills required in that process. Implementation of a child's learning plan becomes more probable, as it has been developed "on the scene" by the classroom teacher.

In-service experience begins with an administrative arrangement for participating schools. All special services, exclusive of speech therapy, will no longer be made available. Provision for future special class referral and placement are discontinued. The in-service experience plan does not in any way affect those special classes already established, but, as a prevention strategy, seeks to preclude future referrals from the regular system. This arrangement induces the school administration to accept full responsibility for the education of every child in the regular classroom. Under these conditions teachers should have the option of participation or transfer to another school; as a result, most teachers who choose to participate have, in effect, elected to support this arrangement and its assumptions.

The administrative arrangement included in this strategy encourages the possibility of teacher self-sufficiency. Having created this opportunity, the process of in-service experience may begin. The primary agent in this process is a person whom we shall identify or describe as the "classroom specialist". His major function in the process is to arrange in-service learning experiences for the classroom teachers in his building. He arranges these experiences in response to a classroom "problem situation" referred by the teacher. The shared objective of the classroom teacher and specialist is the successful modification of such problem situations. All modification strategies must be consistent with the terminal goal of teacher self-sufficiency. Any plan developed by the teacher and specialist must therefore be an "in the classroom" strategy developed and implemented by the classroom teacher. At no time does the classroom specialist work directly with a child, unless it is to model a technique or demonstrate the use of a material for a classroom teacher. An underlying assumption of the in-service experience plan is that no child in the regular classroom need fail if he has been adequately taught. The plan also assumes that no teacher need fail if he has experienced adequate in-service learning -- whether independent of or through such a program.

The in-service experience plan is a strategy aimed toward the improvement of services to mildly handicapped children in the regular classroom through in-service experience to teachers. This involves gradual progress toward teacher self-sufficiency in the basic skills areas, such progress proceeding according to the classroom teacher's stated needs. The in-service experience plan might require between one and three years to bring most teachers in a given school building to criterion. The process may seem slow but consider the result if a classroom specialist was in every building in your school district. If successful, benefits would not be limited to mildly handicapped children alone, but would be evident throughout the entire range of individual learning differences. Like all other strategies, however, the in-service experience plan will be of little value unless it is tried and evaluated. The basic criterion for evaluation should be student performance. Although such data will indirectly measure teacher performance, other criteria for measuring change in teaching behavior may also be used. Some advantages of this strategy have already beeb cited. The final success of the in-service experience plan, however, depends on three basic assumptions: (a) a teacher can change his teaching behavior, (b) he can become self-sufficient in teaching the basic skills, and (c) he wants to be competent in these areas. If these assumptions are not valid, the in-service experience plan is not a valid strategy. If such assumptions are indeed acceptable, then educators may finally realize a self-fulfilling prophecy of success.

Title of Article: Effects of Isolated Study on Childrens' Academic Performance

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Running Title: Isolation Effects

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Abstract

The effects of providing students with the opportunity for isolated study were examined. Measures were taken of the amount of assigned reading work accomplished. The design combined time-series observations with an experimental treatment. Results indicated that when work accomplished is the dependent variable, isolation produces significant facilitation over the normal classroom environment. Results were discussed in light of the correspondence between measures of classroom performance and measures of general achievement.

Another Look at Isolation Effects

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New Mexico State University
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Our information regarding classroom environments which are most conducive to learning is very limited. One approach that has at least intuitive appeal is to reduce the number of distracting events that interfere with a student's work. The usual outgrowth of this approach is to isolate the student in some way from his peers. However, both Cruickshank, et al, (1961) and Rost (1967) failed to demonstrate any advantage in achievement for isolating students in booths or cubicles. In these studies the dependent variable was general achievement as measured with such instruments as the Wide Range Achievement Test and the Stanford Achievement Test.

Measures of general achievement are useful in such studies only if one can argue that there is good fit between the materials assigned to the students, the work sheets and the learning exercises, and the achievement measures. That is, one must assume that completing the assigned materials will have an influence on the child's performance on the general achievement measures. Evidence presented by Stephens (1967) suggests that general achievement measures are insensitive to almost all educational inventions, materials or administrative arrangements with the exception of time spent in school. Why this is so is unclear. General achievement measures may be inappropriate samples of the schools academic goals. On the other hand, the classroom assignments chosen by teachers may not be especially effective facilitators of achievement. In any case there is probably not a very good fit between those activities which we have a student perform and the general measures we take to assess his progress. Assessing the efficacy of certain instructional or classroom variables such as isolation may require adoption of a more sensitive measure such as the amount of assigned work that a student performs.

The present study was designed to assess the effects of a classroom variable, isolation, on what would appear to be a sensitive performance measure, work accomplished.

In this study the independent variable was isolation and the dependent variable was the number of pages that students performed in their program workbooks. A time series design with counterbalancing was employed.

Method

Subjects and Setting

The study was conducted at the Experimental Educational Environment (EEE), a Newark School District ESEA Title III program which is located at the University of Delaware. Thirteen EMR children whose ages ranged from 6 to 11 attended this class. Eight of these children served as Ss.

The EEE was administered on a contingency management system with an ancillary token economy (poker chips) where children were rewarded for academic and socially appropriate performances. Work sheets and programmed texts were provided regularly. Individual contracts were established on a piece-work basis in which there was a specific relation between the amount of work performed and the number of tokens earned. The classroom operated on a free-spending system (Neisworth, Deno and Jenkins, 1969) in which the student chooses how and when he will spend his earnings. The child exercised an option of stopping work on an academic task after he has acquired sufficient tokens to enter the reinforcing events (RE) area, or of remaining at work in the task where he may continue to earn tokens for later spending. The RE area was located in the rear of the classroom. There, the children engaged in a number of high preference behaviors such as bowling, painting, writing on the chalkboard, etc. A store within the RE area contained other commodities such as coloring books, bubble bath, candy, (the larger items are purchased on a lay-away plan), etc., which could be purchased at the end of the school day.

Adjacent to the classroom were several small study rooms. These study rooms and the classroom shared a common one-way window. The E observed all children during the three weeks of the study from behind this window.

Procedure

The study lasted for three weeks. The teacher scheduled a one-half hour reading period in the mornings. At the end of the half hour the teacher and a classroom aide checked and recorded the number of pages each child had completed. The child was paid one token for each page completed. During the check the student read aloud several frames from the program and his pages were counted only if he read correctly. Since the answers are included in the program this precaution was undertaken to prevent children from merely transcribing the answers instead of using them as source of feedback. The same recording procedure was maintained throughout the study.

During the first week all of the students remained in the classroom as usual. Performance in Week I was a baseline against which later performance could be contrasted.

At the start of the second week four of the eight children were selected at random and sent to four small rooms adjacent to the EEE facility. This group who followed the sequence Classroom (Week 1), Isolation (Week 2), Classroom (Week 3) will be designated CIC.

The second group of four children followed the sequence Classroom (Week 1), Classroom (Week 2), Isolation (Week 3) and will be referred to as CCI. At the beginning of the third week CIC children returned to the classroom and CCI children took their places in the study rooms.

Results and Discussion

Figure 1 permits a comparison of each group's performance during its isolation week with its performance during its classroom weeks. Inspection of Group CIC indicates that this group completed more pages on each isolation day than it did on corresponding days in the classroom. For example, the number of pages completed during isolation on Monday exceeds either the number of pages completed on the previous or succeeding Monday spent in the classroom. Inspection of Group CCI also indicates that it completed more pages on each isolation day than it did on corresponding days in the classroom.

Insert Figure 1 about here.

Average daily performance for the two groups (Table 1) again demonstrates the superiority of the isolation treatment. Both groups completed the greatest number of pages when they were isolated.

Insert Table 1 about here.

Median performances were calculated for each student on the number of pages completed during each of the three weeks. Eight of the eight children performed higher during the isolation week than during Week 1 in the classroom ($p < .004$, Sign Test). Seven of the eight children performed higher during isolation than during their second week in the classroom ($p < .035$, Sign Test).

The data suggest that isolation is a potent variable when work accomplished is the dependent variable. That the effect held for all of the children studied is important. There were, of course, differences in the extent to which different children were affected.

How such a variable could be implemented practically in the schools is another matter. Schools clearly do not have resources available for providing individual office spaces for each student. However, building isolation booths similar to Rost's and Cruickshank's may be entirely feasible.

The effect of isolation on general achievement was not assessed in the present study. Had an achievement measure been employed the effect of isolation may have been demonstrated, although earlier research on this subject has failed to uncover a reliable effect. Perhaps, both performance measures, for example, work accomplished, and the more common achievement measures should be included in research on classroom variables such as isolation, lest viable variables go undetected. The inclusion of performance measures would vary, of course, with our confidence in the goodness of fit between classroom assignments and measures of general achievement.

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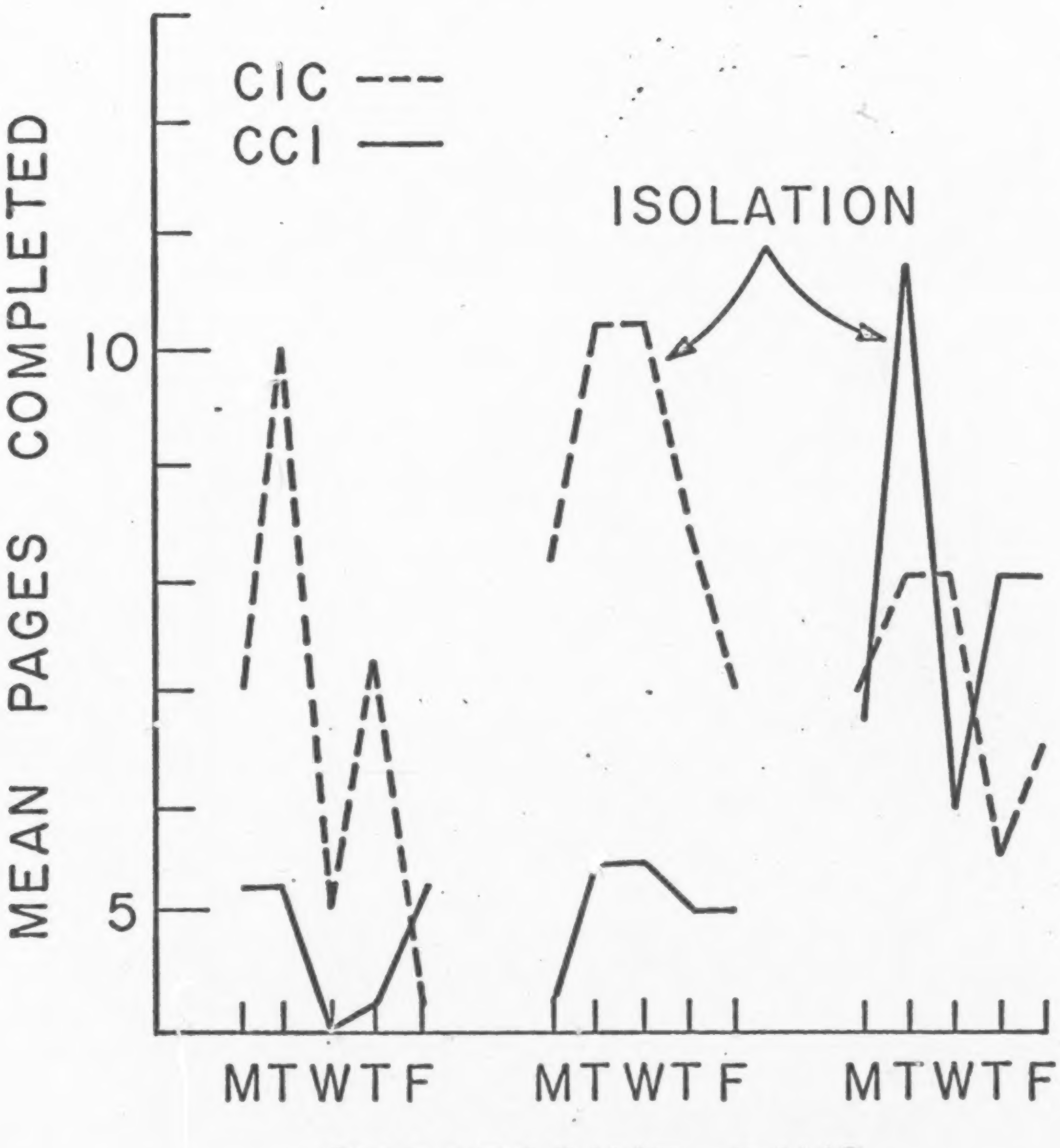
Table 1

Means and Standard Deviations of Daily Completed Pages by the Two Treatment Groups Over Three Weeks

GROUP	1		2		3	
	M	SD	M	SD	M	SD
CIC	6.2	3.6	8.9	4.4	7.0	4.0
CCI	4.8	1.8	5.1	1.3	8.1	2.8

Figure Captions

1. Mean pages completed by two treatment groups, Classroom-Isolation-Classroom (CIC) and Classroom-Classroom-Isolation (CCI).


CIC ---
CCI —
ISOLATION
10
5
MEAN PAGES COMPLETED
MTWTF
MTWTF
MTWTF
SUCCESSIVE DAYS

ART BY THE HANDICAPPED:
A MODEL FOR AN EXHIBITION AND A SYMPOSIUM

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A statewide Exhibit of Art by the Handicapped was initiated in 1969 under the co-sponsorship of the Department of Art, Northern Illinois University, and the Instructional Materials Center, Office of the Superintendent of Public Instruction, State of Illinois. The success of the original exhibit resulted in the project becoming an annual event.

The purposes of the exhibit are to recognize the contribution that art makes to the lives of the handicapped, to bring examples of their artistic ability to the attention of the lay and professional groups, to draw attention to the problems of the handicapped, and to give recognition for a job well done.

In order that this exhibit might serve as a model for similar projects, those directly involved with its development present the steps leading from its inception to its implementation.

(1) Direct experience with handicapped children provided the inspiration to develop

an exhibit. Encounters with their parents and teachers indicated the need for something to be done to focus the attention of the public on the contribution art makes to the lives of the handicapped.

(2) Persons involved with the handicapped were contacted for their reactions to the idea of a statewide exhibit of art work by the handicapped. The response was encouraging.

(3) The Head of the Department of Art, Northern Illinois University, was approached about the possibility of the department sponsoring the exhibit.

(4) Since the exhibit would be intradepartmental and involve the efforts of both

art educators and special educators, the Instructional Materials Center, Springfield, Illinois, was consulted about the possibility of co-sponsoring the project.

(5) An agreement was made between the Northern Illinois University Department of Art and the Instructional Materials Center to co-sponsor the project for 1970 and 1971. The 1972 exhibit and symposium has involved the Department of Special Education, Northern Illinois University, as the third co-sponsor of the project. In the past, they had participated without formal recognition.

(6) Dates were set and planning began. Responsibilities were outlined. Figure 1 illustrates the responsibilities as outlined for the third (1972) exhibit of Art by the Handicapped.

Figure 1

THIRD ANNUAL EXHIBIT OF ART BY THE HANDICAPPED AND SYMPOSIUM

Outline of Responsibilities

Northern Illinois University Department of Art	Instructional Materials Center Office of the Superintendent of Public Instruction	Northern Illinois University Department of Special Education
Plan exhibit	Plan exhibit	Plan exhibit
Provide mailing list of art teachers and supervisors	Providing mailing list of special educators and others interested in Exhibit and Symposium	Provide addresses of organizations or persons who should receive publicity
Develop copy and layout for brochure announcing the exhibit and symposium	Print brochure	
	Mail brochures including reply cards. Receive return cards. Second Mailing to those intending to participate	Lay ground work for distributing publicity at conventions
Distribute publicity brochures at state I.A.E.A. Convention	Distribute publicity brochures at A.A.M.D., I.C.E.C., and I.A.E.A. state conventions	
Assist in receiving art work	Assist in receiving and delivery of entries to N.I.U.	Assist in receiving art work
Arrange for student help to prepare work for selection committee -- student chapter of National Art Education Association		Arrange for student help to unpack and pack work -- study chapter of Council for Exceptional Children
Prepare work for selection	Return work not selected. Send certificates to participants. Send letters of appreciation to teachers. Mount/mat work	
Hang exhibit		Assist in hanging the exhibit
Help document slide-tape	Photograph, produce, and distribute slide-tape presentation	
Remove exhibit. Prepare exhibit for travel	Provide booking and transportation for traveling exhibit	
Select art work, do layout for brochure to accompany exhibit	Print brochure	Provide assistance and consultation

Figure 1 cont.

Northern Illinois University Department of Art	Instructional Materials Center Office of the Superintendent of Public Instruction	Northern Illinois University Department of Special Education
Local new releases. Send copies to O.S.P.I.	State new releases. Send copies to Department of Art and Special Education	
National and State Art Education Association Newsletters	State Newsletters including the Department of Mental Health	
Symposium publicity	Symposium publicity	Symposium publicity
Plan symposium	Plan symposium	Plan symposium
Contact speakers	Contact speakers. Send contract forms	
Arrange for workshop leaders		
Do program layout	Print program	
Arrange for student NAEA involvement		Arrange for student CEC involvement

(7) Announcements were sent to all public and private schools and agencies throughout the state which provide programs for the handicapped. Schools and agencies planning to participate returned reply cards.

(8) Response to the first exhibit was great! Seventy-five public and private schools and agencies submitted art work by the handicapped, totaling over 500 entries representing all areas of the handicapped. The next year over 110 schools and agencies submitted over 1,000 pieces of art work. To date, we have mailed over 300 packets of entry material for the 1972 exhibit. Both two- and three-dimensional works become part of the exhibit. After their first public display, photographs of three-dimensional works become part of the traveling collection.

(9) Art educators who had previous experience with handicapped children selected the 100 pieces to be included in the 1970 exhibit which later developed into a traveling exhibit. In 1971, the exhibit size increased to 125 pieces. When the exhibit travels, it is divided into (5) five, (25) twenty-five piece collections. The entire collection may be booked providing a special request is made. Booking information may be obtained from:
Mr. Dan Dobbert, I.M.C., Library Room 176,
Northern Illinois University, DeKalb, Illinois
60115.

(10) Certificates were sent to each individual who submitted art work. In addition, each child received a copy of the program that accompanied the exhibit. Each teacher received a letter of appreciation for participating.

(11) Much of the art work that could not be used in the second (1971) exhibit was presented to Illinois legislators, whose efforts have helped make Illinois a leader in the movement to improve educational opportunities for the handicapped. The remainder of the work was returned. Among the art not chosen for this year's exhibit was a ceramic elephant produced by a 12-year old Des Plaines youth, who traveled to Washington, D.C., to present his work to the President of the United States. Also, a Lincoln decoupage was presented to the Governor by the artist who was brought to Springfield from Sandwich for the occasion.

(12) Members of the student chapters of the National Art Education Association and the Council for Exceptional Children assisted members of the art education staff to prepare the pieces selected for the exhibit. The art

work was mounted and matted. Two standard sizes of mats were used to add to the aesthetic appearance of the exhibit and for the convenience of packing and shipping the exhibit.

(13) Students also helped to hang the exhibit for its opening at the Northern Illinois University Center.

(14) Many persons came to view the exhibit -- teachers, students, parents, the handicapped, and officials and personnel from the Office of the Superintendent of Public Instruction. Those who visited the exhibit were impressed with the achievements of the handicapped. Some remarked, the work was no different than anyone else that age could have done.

(15) As a part of the opening of the second annual exhibit of Art by the Handicapped, a one day Symposium was held. The Symposium included keynote speakers, representing both the areas of art and special education, and workshops during which participates could become actively involved. Our 1972 Symposium is scheduled for March 17.

(16) Support for the project has been both financial and non-financial. Staff time is provided by the University, I.M.C., and volunteers. The University and I.M.C., Office of the Superintendent of Public Instruction, have recognized this program as a valid educational project. Funds were secured from the S.E.I.M.C. Network and O.S.P.I. for the 1971-1972 Symposium, workshops, and exhibit.

(17) This program will be presented at the 1972 Council for Exceptional Children Convention in Washington, D.C., March 22, 1972.

Other Outgrowths of the Exhibit

. An annual symposium for art educators and special educators in now held in conjunction with the exhibit at Northern Illinois University.

. The exhibit has been extended to include both two-and three-dimensional art work. Only two-dimensional works travel. Three-dimensional works are photographed and the original is returned. The photograph travels as part of the exhibit.

. Six regional workshops devoted to art for the handicapped are being conducted this year throughout Illinois.

. A joint major at the undergraduate level in Special Education and Art Education is going to be offered at Illinois State University. For more information contact Mrs. Marilyn Newby, Art Department, Illinois State, University, Normal, Illinois 61761.

. Sectional meeting devoted to art and special education have been included as a part of the Illinois Art Education Association state conference.

. The traveling exhibit has appeared at international, national, regional, and state professional conferences.

. The addition to the traveling exhibit, a slide-tape presentation of art work in the exhibit is being prepared for circulation. Arrangements for booking the slide-tape presentation may be made through Mr. Dan Dobbert, Instructional Materials Center, Northern Illinois University, DeKalb, Illinois 60115.

. The third annual exhibit of Art by the Handicapped will be on display at the Northern Illinois University Center from March 1 to March 18, 1972. The Symposium will be held at the University Center on March 17, 1972.